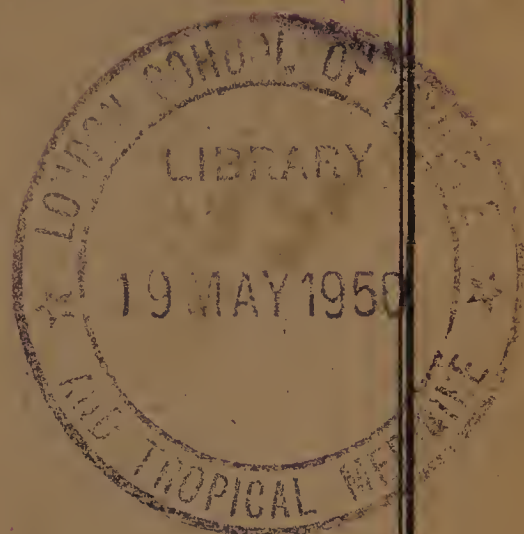


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COLONY OF MAURITIUS



Annual Report
on the
Medical and Health Department
1948



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PRINTED AND PUBLISHED BY
J. ELIEL FELIX, GOVERNMENT PRINTER,
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Annual Report on the Medical and Health Department 1948

General Observations

The year 1948 has provided little change in the administrative machinery of the department but some advance has been made in various directions as will be seen by perusal of this report. On the medical side some progress has been made in the building programme, in the improvement of ward fixtures and in the supply of surgical and other equipment; additional rural areas have been included in the mobile dispensary service and orthopaedic clinics instituted in the general hospitals. Occupational therapy is being carried out in Floreal and Mental hospitals and, in the latter, insulin treatment and electro-convulsive therapy have been initiated.

2. The policy of awarding scholarships to nursing and health personnel has been pursued and there are now in the United Kingdom under training six student nurses, one student physiotherapist and one sanitary inspector. Two medical officers have been selected to go to England in 1949 to follow courses of training for diplomas in radiology and anaesthesia respectively.

The training of midwives has been established on a new and more practical basis.

3. The work of the malaria branch has progressed satisfactorily as regards construction, maintenance and other larvicidal measures, and an indication is given of the results of the work during the past few years. The island-wide attempt to eradicate malaria by means of insecticides was about to commence at the close of the year.

4. The rapid development of Plaisance as an air-port has thrown a heavy strain on the Health personnel of Grand Port district, aircraft of three different lines making regular calls at Mauritius.

5. The isolation of *Br. abortus* (Bang) from cows of the Government dairy, to which reference is made in Appendix I is a matter for serious consideration in an island such as Mauritius.

6. The research work carried out on hookworm, a report of which will also be found in Appendix I indicates that this disease is responsible only in small part for the low physical standard of school children in rural areas and that the principal factors are malaria and malnutrition.

I. Administration

7. Dr R. Lavoipierre was appointed Deputy Director, Medical Services, on 9th March, 1948.

The following officers assumed duty on first appointment on the dates shown—

Dr V. Poonoosamy, Medical Officer, 12th July.

Dr R. Raffray, Medical Officer, with effect from 15th December, 1947.

Dr. C. A. Bathfield, Orthopaedic Surgeon, 1st January.

Miss Lise Harel, Occupational Therapist, 1st October.

Miss Rosemay Mary Scott, Occupational Therapist, 1st October.

The following officers proceeded on vacation leave during the year—

Dr. L. N. R. Comty, Medical Superintendent, Mental Hospital, 10th May.

Dr. L. R. du Vergé, O.B.E., M.C., Medical Superintendent, Victoria Hospital, 22nd June.

Dr. L. M. J. R. Pilot, Medical Officer of Health, Port Louis, and Port Health Officer, 8th March.

Dr. J. J. A. Cantin, Medical Officer, 30th January.

Mr. R. Avice du Buisson, Assistant Government Chemist, 7th December.

The following officers returned from overseas leave—

Dr. H. André, M.B.E., Medical Officer, 7th January.

Dr. Roger Pilot, M.B.E., Medical Officer, 7th January.

Dr. W. R. Dupré, Radiologist, 23rd January.

Dr. H. D. Tonking, Senior Pathologist, 29th February.

Dr. F. X. Letellier, Medical Officer, 1st September.

Dr. M. Shun Shin, Medical Officer, 17th September.

Dr. J. J. A. Cantin, Medical Officer, 30th September.

Dr. L. M. J. R. Pilot, Medical Officer of Health Port Louis and Port Health Officer, 22nd December.

The following officers retired from the Service during the year —

Dr. Roger Pilot, M.B.E., Medical Officer 16th April.

Dr. W. R. Dupré, Radiologist, 31st August.

Dr. J. D. Dyson, M.B.E., Medical Superintendent, Mental Hospital, 9th December.

FINANCIAL

8. The revenue of the Colonial Government for the financial year 1947-48 was Rs. 39,856,646 of which Rs. 157,932 was received through the Medical and Health Department. The actual expenditure on medical services was Rs. 3,151,432 or 6.4 per cent of the total expenditure for the year (Rs 49,147,495). This represents a sum of seven rupees and thirteen cents per head of the population.

Under the Development and Welfare Plan the revenue was Rs. 5,000 and the expenditure Rs. 1,128,174,

9. The following analysis of the general estimates indicates the distribution of the allocation—

MEDICAL AND HEALTH ESTIMATES 1947-48

	<i>Administration</i>		<i>Medical Services</i>		<i>Health Services</i>		<i>Total allocation</i>
	<i>Rupees</i>	<i>Percentage of allocation</i>	<i>Rupees</i>	<i>Percentage of allocation</i>	<i>Rupees</i>	<i>Percentage of allocation</i>	<i>Rupees</i>
Personal							
Emoluments ...	97,731	9·7	762,638	75·9	144,754	14·4	1,005,123
Other Charges :							
Recurrent ...	27,780	1·6	1,241,000	63·8	700,850	34·6	2,084,930
Non-recurrent ...	5,000		90,300		20,000		
TOTAL ...	130,511	0·30	2,093,938	—	865,604	—	3,090,053

These figures represent an expenditure of seven rupees and four cents per head of the population at 31st December, 1947 (mid-financial year to which these estimates apply) distributed as follows—

	<i>Rs. c.</i>
Cost of Administrative Services per head ...	0 30
„ Medical „ ...	4 77
„ Health „ ...	1 97
TOTAL ...	7 04

10. The principal increases in recurrent expenditure were due to increased wages and costs of hospital supplies such as provisions, drugs, clothing and bedding. The non-recurrent items provided for new sterilizers, refrigerators and X—ray plant for the hospitals and for three vehicles for the ambulance service. Air conditioning plant for the operating theatres at Civil and Victoria hospitals was included but has not yet arrived in the colony.

LEGAL

11. The following legislation was passed—

Ordinance No. 11. cited as : The Penicillin Ordinance, 1948—to control the sale and supply of penicillin and certain other substances.

Ordinance No. 17. cited as : The Public Health (Amendment) Ordinance, 1948—further to amend the Public Health Ordinance, 1925.

Ordinance No. 31, cited as : The Prevention of Malaria (Amendment) Ordinance 1948—to amend the Prevention of Malaria Ordinance, 1946.

Ordinance No. 47. cited as : The Director of the Medical and Health Department (change of title) Ordinance, 1948—to alter the title of the Director of the Medical and Health Department into that of Director of Medical Services.

Government Notice No. 107. cited as: The Cemeteries (Amendment) Regulations 1948—regulations made by the Director of the Medical and Health Department under Article 193 of the Public Health Ordinance, 1925.

Government Notice No. 130. cited as: The Pharmacy (Addition to List of Poisons) Ordinance 1948—Order made by the Governor under Article 36 of the Pharmacy Ordinance 1912 to add Amidone, Desomorphine and Pethidine to the list of Part I poisons.

Government Notice No. 163. cited as: The Prevention of Malaria Regulations, 1948—Regulations made by the Director of the Medical and Health Department under Section 14 of the Prevention of Malaria Ordinance, 1946.

Government Notice No. 196. cited as: The Public Health (Disposal of Refuse) Regulations 1948—Regulations made by the Director of the Medical and Health Department under Article 193 of the Public Health Ordinance, 1925.

Government Notice No. 229. Rules for Nursing Students in Public Hospitals.

Government Notice No. 290.—Regulations made by the Director of Medical Services under Articles 155 and 193 of the Public Health Ordinance 1925, as subsequently amended—to amend Regulations 2 and 4 of the Regulations published under Government Notice No. 202 of 1947.

Proclamation No. 19.—to extend the application of Part IV of the Dangerous Drugs Ordinance 1934 to Amidone and Metopon.

II. Laboratory Services

12. As in 1947, these continued to be provided by the Central Laboratory at Reduit and branch laboratories at Civil and Victoria Hospitals. It has not yet been possible to obtain the additional technical personnel necessary to provide further facilities and, indeed, the staff is already fully occupied. Despite this, some useful research work was done. The report of the laboratory services is at Appendix I.

III. Medical Services

HOSPITALS

13. Further progress has been made in regard to building and equipment.

Accommodation.—Two new wards were completed and a third was under construction at Civil Hospital; one was completed and another is in course of construction at the Mental Hospital and the quarters for nurses at Flacq were extended.

Plans for the orthopaedic and rehabilitation centres at Candos are complete but unfortunately a start on building has not been made. This is an urgent matter since, but for the kindness of the Mauritius Jockey Club this branch of surgical work could not have been maintained at its present extent.

14. Water supply was provided and wash hand basins, sinks, etc., were installed in all wards of Civil Hospital and a start was also made in Victoria Hospital.

15. *Equipment*.—Provision of modern equipment and replacements are proceeding according to plan. Electric sterilizers have been provided for Civil, Victoria and Moka hospitals and electric fans have been installed in the outpatients department of Civil Hospital. This hospital is now provided with a Boyle's anaesthetic apparatus. The standardising of ward furniture and equipment is proceeding.

16. *Personnel*.—The medical establishment remained as in 1947 but with the increasing accommodation additional medical officers are required.

Nursing staff.—The 96-hour fortnight which was introduced at the Civil Hospital in 1947 has now been extended to the Mental and Victoria hospitals and a snack meal is provided during working hours to nursing staff both on day and on night duty. A site for a nurses' home in the vicinity of the Civil Hospital at Port Louis has been found and proposals for acquiring this and for construction of a building are proceeding. The recruitment of female nursing staff still proves to be a difficult problem, providing only numbers sufficient to fill vacancies in the existing establishment. Until a larger number of suitable students come forward there is little prospect of instituting district services such as health visiting or of extending child welfare work. It is confidently expected that the improvement of conditions of service and the establishment of nurses' homes at the two training centres will stimulate recruitment. Members of the nursing staff undergo an annual medical examination, including screening of the chest.

Twenty-eight nurses passed the final examination in 1948 and this was made the occasion of instituting a formal ceremony at which certificates and prizes were presented by Mrs. Harford in the presence of His Excellency the Officer Administering the Government, heads of religious communities, members of the Legislative Council and friends of the nursing staff. The department is indebted to the Chairman and members of the Town Board of Rose Hill-Beau Bassin who kindly gave the use of the Town Hall for this purpose. Social entertainments for staff at the Christmas season are now a feature at the general hospitals.

There are at present six Mauritian women training as nurses in England and another is training there in physiotherapy. Two more completed a course in occupational therapy and now occupy posts in that capacity in the department.

17. Hospital statistics—

					<i>Number of cases treated</i>	
					<i>in</i>	<i>at</i>
					<i>Hospitals</i>	<i>Dispensaries</i>
Tuberculosis	...	...	...	...	525	629
Syphilis	...	...	...	...	278	1,303
Gonococcal infection	...	...	...	...	153	754
Soft chancre	...	...	...	...	39	176
Bacillary dysentery	...	...	...	...	56	31
Amoebiasis	...	...	...	...	251	1,822
Other and unspecified forms of dysentery	...	...	...	...	159	1,436
Whooping cough	...	...	...	...	155	7,290
Rubella (German measles)	...	...	...	...	11	4
Malaria	...	...	...	...	1,576	57,389
Schistosomiasis	...	...	...	...	91	360
Filariasis	...	...	...	...	40	136
Ankylostomiasis	...	...	...	...	537	9,794
Ascariasis	...	...	...	...	65	8,744
Scabies	...	...	...	...	170	8,131
Neoplasms	...	...	...	...	299	—
Asthma	...	...	...	...	287	3,033
Beriberi	...	...	...	...	4	12
Pellagra	...	...	...	...	53	166
Scurvy	...	...	...	...	3	5
Rickets	...	...	...	...	2	7
Other avitaminoses	...	...	...	...	342	1,278
Anaemias	...	...	...	...	1,392	13,957
Diseases of eye	...	...	...	...	615	5,694
Diseases of the circulatory system	...	...	...	...	845	2,099
Influenza	...	...	...	...	618	23,091
Lobar pneumonia	...	...	...	...	257	127
Broncho-pneumonia	...	...	...	...	126	130
Other and unspecified pneumonias	...	...	...	...	58	59
Bronchitis	...	...	...	...	752	4,416
Diseases of teeth and gums	...	...	...	...	96	24,616
Gastro-enteritis and colitis...	...	...	...	...	419	7,269
Diseases of the skin and cellular tissue	...	...	...	...	2,674	18,216
Arthritis and rheumatism, except rheumatic fever	...	...	...	...	216	7,394
Accidents, poisonings and violence	...	...	...	...	3,607	14,713

18. *Radiology*.—Upon the retirement of the radiologist, Dr. W. R. Dupré, a junior medical officer was posted to the Radiology department for preliminary training. He has since been granted study leave and will proceed to the United Kingdom for further training in 1949.

The dressers posted for training in radiography in 1947 have made good progress and are proving to be an asset in that capacity. This year a nurse has been posted for similar training at Victoria Hospital.

All X-ray examinations had been carried out at Victoria Hospital (plating) and at Moka Hospital (screening) but a portable set has now been obtained for Civil Hospital which enables injuries and lesions of the skeletal tissues to be examined there. A new plant which will enable deep-ray therapy to be administered has now been received and will be installed in the new radiology department at Victoria when that is built.

The demand for X-ray examination and treatment increases very markedly from year to year. 3,044 examinations were made at Victoria Hospital in 1948 as compared with 2,146; 1,209 and 642 in the previous three years. 246 patients underwent irradiation with infra-red and 125 with ultra-violet ray; 16 were treated by means of surgical diathermy and 21 by galvanic and faradic currents, all as outpatients.

At Moka, 2,731 cases were screened, 1,015 being examinations of the upper alimentary tract and 1,716 of the chest. This compares with 593 and 960 in 1947.

Radium for therapeutic purposes is now available at both Victoria and Moka hospitals. 41 cases were irradiated at Moka and 39 at Victoria. Of this total of 80 cases, 47 were advanced carcinoma of the cervix uteri and the radiologist expresses the view that malignant disease in general, and carcinoma of the cervix in particular, are definitely on the increase.

19. Orthopaedic surgery

A.—STAFF.

During 1948–49 the staff of the Orthopaedic Branch of the department was increased by the appointment of Mr. C. A. Bathfield, F.R.C.S. as Orthopaedic Surgeon, of Miss L. Harel and Miss R. Scott as Occupational Therapists, and of Miss V. Athow as Secretary. The appointment of Mr Bathfield relieved considerably the increasing pressure of work in this branch and allowed extension of its scope. It became possible to establish additional outpatient clinics at Civil and Moka Hospitals and to have two surgeons working simultaneously at Victoria Hospital where most patients attended, the services of one orthopaedic surgeon became available for any special emergencies at these three hospitals, and district clinics for the follow-up of old cases of poliomyelitis could be continued without interfering with the normal routine of hospital work as had happened in 1947–48.

Occupational therapy had been initiated at Floreal Hospital in 1946 by a teacher from the Department of Education, Miss Y. Thomasse. Excellent work had been done, especially in teaching the local handicrafts, but the scope and the number of children who could be taught were limited. The return of the two occupational therapists from their training in England remedied these defects and now all the children who are old enough receive tuition. Further, these two teachers are able to devote two half days per week to the Mental Hospital in Beau Bassin.

Accurate and detailed case records are of great importance in orthopaedic work, as after-treatment of many diseases and injuries continues for years. The addition of a secretary to the staff has done much to facilitate this part of the work and has brought the orthopaedic unit further into line with practice in clinics in England.

B.—FLOREAL HOSPITAL

The average number of patients in Floreal Hospital fell to 145 where it remained until the end of November when the new epidemic of poliomyelitis broke out. Of this number about sixty children were those left from the epidemic of 1945, being too severely crippled to be discharged. Most of the remainder were patients who had been admitted to hospital for operations to correct deformities and to improve function. Amongst these were some who had been disabled for many years, including two women who had not walked for over twenty years and both of whom became ambulant.

Some valuable new equipment was received for the operating theatre and for the physiotherapy department. This extended the range of work in both departments. More equipment was made in the workshops of H.M. Prisons at Port Louis; this included several massage couches.

C.—SPECIAL DISEASES AND INJURIES

Poliomyelitis

In the middle of November an increase in incidence occurred in Port Louis. Later the disease spread north to Pamplémousses and Rivière du Rempart, then in turn to Flacq, Grand Port and Plaines Wilhems. Finally Black River and Savane were affected but never to the same extent as in the other districts. The maximum number of daily cases (onset) was recorded on 27th December, when there were 17. By 31st December, 152 cases had been notified with 7 deaths.

To provide inpatient treatment three old wards were re-opened and at one stage there were 260 children in the hospital. At the same time 18 old cases were temporarily transferred to Moka Hospital for one month. A few adult women were admitted but most of the men were treated at Civil Hospital. Accommodation proved sufficient even at the height of the epidemic and it was never necessary to refuse urgent cases. Tribute is due to the nursing staff who bore uncomplainingly a heavy strain during this epidemic.

Tuberculous disease of Bone and Joint

During 1948 a register was compiled of the cases of tuberculous of bone and joint seen at the outpatient clinics and in the hospitals. The 85 cases which were recorded were distributed as follows—

Region affected				Number	Age groups	Number
Spine	...	...	...	41	0—5	14
Knee	...	...	...	15	5—10	14
Hip	...	...	...	13	10—15	12
Ankle	...	...	...	3	15—20	9
Foot	...	...	...	2	20—25	14
Shoulder	...	...	...	1	over 25	22
Elbow	...	...	...	4		
Hand	...	...	...	1		
Wrist						
Tendon sheaths				5		
				85		

Osteomyelitis and Suppurative Arthritis

In common with other pyogenic infections osteomyelitis and suppurative arthritis are frequent diseases in Mauritius. The prognosis has changed completely during the last fifteen years with the discovery of the sulphonamide drugs and more especially penicillin. If treatment is begun early and is adequate—to be adequate it must include splintage, surgery and chemotherapy—a large percentage of cases may be cured permanently; but if any one of these conditions be neglected the old unhappy chronic complications such as discharging sinuses and stiff joints may still occur. Many cases still do not get the benefit of early adequate treatment and co-operation between patients, private practitioners and hospital medical officers is required to improve the present results.

Industrial Injuries

The importance to be attached to rehabilitation of patients who have had injuries, especially those who work in industries, has not yet been fully appreciated in the Colony. Almost every patient who has fracture or joint injury can benefit from early treatment given by a physiotherapist or rehabilitation officer and the gain is not only in terms of speed of convalescence but often in degree of final recovery. Although handicapped by lack of accommodation for this work, treatment has been given to many patients at Civil, Victoria, Moka and Floreal Hospitals and larger numbers can be taken.

Amputees

A larger number of simple walking appliances for amputees were made in 1948 and it is planned to increase this number again in 1949 while improving the quality and making a more modern pattern. It must be stressed that surgeons should consider the needs of the limb maker. Amputation stumps should be fashioned according to the standards laid down by the Ministry of Pensions at Chelsea.

Instrument making

In July the workshops of H. M. Prisons received an important consignment of machinery for the making of surgical instruments. This will speed up the production and improve the quality of instruments when it is brought into use.

In the meantime the work in this department has continued with the same enthusiasm. Since the beginning of the epidemic a magnificent effort has been made to supply the demands of the hospital for emergency equipment.

20. A recapitulation of Reports on Hospitals for the year is given in Table I.

21. *Mental Hospital.*—The report on the work of this hospital is at Appendix II. New features are the introduction of treatment by insulin and electro-convulsive therapy.

Dispensaries

22. This service continued to be provided by thirty-nine district dispensaries and two mobile units. The success achieved and the demand created by the latter justify an increase in the number. Patients treated at dispensaries (stationary and mobile) and outpatients' departments of hospitals numbered 131,030 males and 136,587 females; the total attendances were 363,831 as compared with 300,158 in the previous year.

IV. Health Services**PUBLIC HEALTH**

23. The outstanding feature of 1948 was a severe epidemic of whooping cough which occurred in the early months of the year accounting for 1,729 or 16.4 per cent of the total deaths in the Colony, but apart from this the general level of the health of the community continued to show improvement. Cases of acute poliomyelitis which

had continued to occur sporadically showed a marked upward trend in the month of December which reached epidemic proportions continuing into 1949. Malaria on the other hand reached a new low level, being responsible for 1,580 deaths as compared with an average of 2,701 in the previous five years.

The number of patients treated in hospital was 28,081 as compared with 28,042 in 1947 and in dispensaries 267,617.

The number of cases of malignant disease admitted to hospitals was 299. Deaths from cancer (all forms) and from cancer of the uterus during the ten-year period 1939 to 1948 were as follows—

<i>Year</i>	<i>Deaths from cancer (all forms) (Registrar General's Reports)</i>	<i>Deaths from cancer of the uterus (Registrar General's Reports)</i>
1939 ...	86	25
1940 ...	55	11
1941 ...	52	14
1942 ...	51	10
1943 ...	36	8
1944 ...	46	7
1945 ...	47	12
1946 ...	52	9
1947 ...	68	11
1948 ...	77	13

Medical Certification of Death became compulsory in 1948 in the towns of Port Louis, Beau Bassin-Rose-Hill, Quatre Bornes and Curepipe. The population of these towns (131,000) amounts to approximately one third of the total population. There has been a significant fall in the number of deaths ascribed to ill-defined causes.

VITAL STATISTICS

(i) POPULATION

24. The estimated population of Mauritius at 31st December 1948, was 447,503, an increase of 8,800 over the previous year. Births exceeded deaths by 8,521—general population including Chinese by 2,329 and Indian by 6,192—while arrivals in the colony exceeded departures by 279, 163 general and 116 Indian. The density of the population was 621.5 per square mile.

The distribution of the population was as follows—

<i>Population</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>	<i>No. of males per 1000 females</i>
General (excluding Chinese) ...	70,334	79,022	149,356	928
Chinese	7,848	5,188	13,036	
Indian	145,710	139,401	285,111	1,045
WHOLE POPULATION ...	223,892	223,611	447,503	1,001

TABLE I

REPORT ON HOSPITALS FOR THE YEAR 1948

<i>Hospitals</i>	<i>No. of patients remaining on 31.12.47</i>		<i>New admissions</i>	<i>No. of deaths</i>	<i>No. of patients remaining on 31.12.48</i>		<i>No. of beds</i>	<i>No. of surgical operations performed</i>	
								<i>on in-patients</i>	<i>on out-patients</i>
Civil	223	7,946	458	208	323	1,707	2,684		
Long Mountain	9	1,894	61	41	65	67	125		
Poudre d'Or	12	1,398	38	23	70	210	31		
Flacq	14	2,339	87	26	86	610	—		
Mahebourg	45	2,767	110	32	106	225	541		
Souillac	42	1,978	89	53	103	255	151		
Moka	30	1,883	66	28	83	571	787		
Victoria	173	6,638	377	178	272	1,653	2,654		
Mental (Infirmary only)*	7	310	38	9	64	72	—		
Industrial School	10	264	—	5	16	13	—		
Beau Bassin Prisons	26	664	5	31	54	26	—		
Floreal †	128	360	3	221	291	510	—		
Leper	49	3	3	49	52	—	—		
TOTALS	768	28,444	1,335	904	1,585	5,919	6,973		

The estimated mid-year population on which all rates are based is 441,822.

(ii) BIRTHS

25. The total number of live births was 19,039, an increase of 113 over the number for 1947—

<i>Population</i>				<i>Births</i>			<i>Male births per 1,000 female births</i>
				<i>Male</i>	<i>Female</i>	<i>Total</i>	
General (including Chinese) ...				2,870	2,883	5,753	995
Indian				6,750	6,536	13,286	1,033
WHOLE POPULATION ...				9,620	9,419	19,039	1,021

The following are the birth rates, the figures in brackets relating to 1947—

General population	35.8	(36.9)
Indian	47.3	(47.8)
TOTAL POPULATION	43.1	(43.8)

26. Stillbirths, which are not included either as births or deaths, numbered 1,316 (764 males and 552 females), the percentage of stillbirths to livebirths being 6.9 as compared with 6.7 in 1947 and a mean of 7.6 in the five year period 1944–1948.

Percentage of stillbirths to livebirths 1944–1948.

<i>Year</i>	<i>General Population</i>	<i>Indian Population</i>	<i>Total Population</i>
1944 ...	4.4	8.3	7.2
1945 ...	6.2	10.4	9.1
1946 ...	5.5	9.7	8.4
1947 ...	4.9	7.6	6.7
1948 ...	5.4	7.6	6.9

* Figures shown are for physical diseases only. The Mental Hospital has a total bed strength of 595.

† Hospital for poliomyelitis and orthopaedic cases.

(iii) DEATHS

27. Deaths registered in Mauritius numbered 10,518 representing a rate of 23·8 deaths per thousand of the population. The month of maximum mortality was March with 1,563 deaths followed by April with 1,528. In 1947 the highest figure was recorded in July—

	Population				Total	
	General		Indian		Males	Females
	Males	Females	Males	Females		
Number of deaths ...	1,776	1,648	3,562	3,532	5,338	5,180
Rates per 1,000 ...	21·3		25·2		23·8	
	(17·5)*		(21·6)*		(20·1)*	

The mean death rates for the period 1939 to 1948 were 24·3 for the General, 28·6 for the Indian and 27·0 for the whole population. The annual birth and death rates for this period are shown in the accompanying graph (A).

28. Table II gives a comparison of the causes of death for the past five years with the rates per 1,000 of the population—

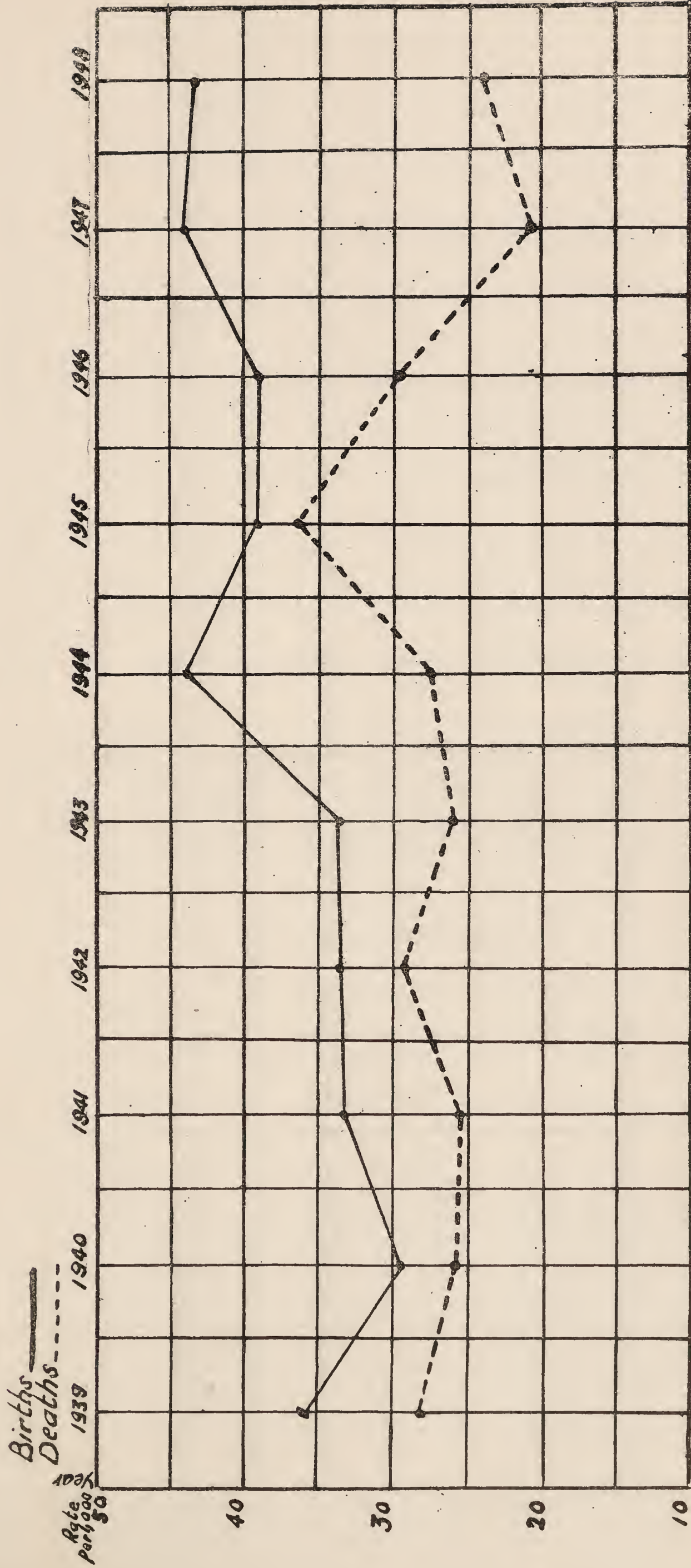
TABLE II

Group	No. of deaths	Rates per 1,000				
		1948	1947	1946	1945	1944
1. Infective and parasitic diseases ...	4,052	9·2	5·47	9·1	11·6	9·07
2. Cancer and other tumours ...	88	0·2	0·17	0·1	0·1	0·14
3. Rheumatism, diseases of nutrition ...	130	0·3	0·26	0·3	0·4	0·29
4. Diseases of the blood and blood forming organs ...	451	1·0	1·33	2·0	2·1	0·61
5. Chronic poisoning and intoxication ...	—	—	0·01	—	—	—
6. Diseases of the nervous system and sense organs ...	378	0·8	0·78	1·0	0·9	0·98
7. Diseases of the circulatory system ...	294	0·6	0·48	0·6	0·6	0·59
8. Diseases of the respiratory system ...	1,318	3·0	2·06	2·7	3·6	2·78
9. Diseases of the digestive system ...	1,078	2·4	2·37	4·6	5·4	3·20
10. Diseases of the urinary and genital system (not venereal or connected with pregnancy or the puerperium) ...	262	0·6	0·69	1·2	1·3	1·12
11. Diseases of pregnancy and childbirth and the puerperal state ...	84	0·2	0·24	0·4	0·6	0·41
12. Diseases of the skin and cellular tissue ...	44	0·1	0·11	0·2	0·2	0·17
13. Diseases of bones and organs of movement ...	5	—	—	—	—	0·01
14. Congenital malformations ...	9	—	0·01	—	—	0·01
15. Diseases peculiar to the first year of life ...	1,009	2·3	2·61	2·8	3·4	2·88
16. Senility, old age ...	285	0·6	0·88	1·2	1·4	1·27
17. Death from violence ...	172	0·4	0·40	0·4	0·6	0·49
18. Ill-defined causes of death ...	859	1·9	2·17	3·0	3·8	3·04

*Figures in brackets are the rates for 1947.

GRAPH A.

BIRTH AND DEATH RATES (PER 1,000) FOR TEN YEARS 1939-1948

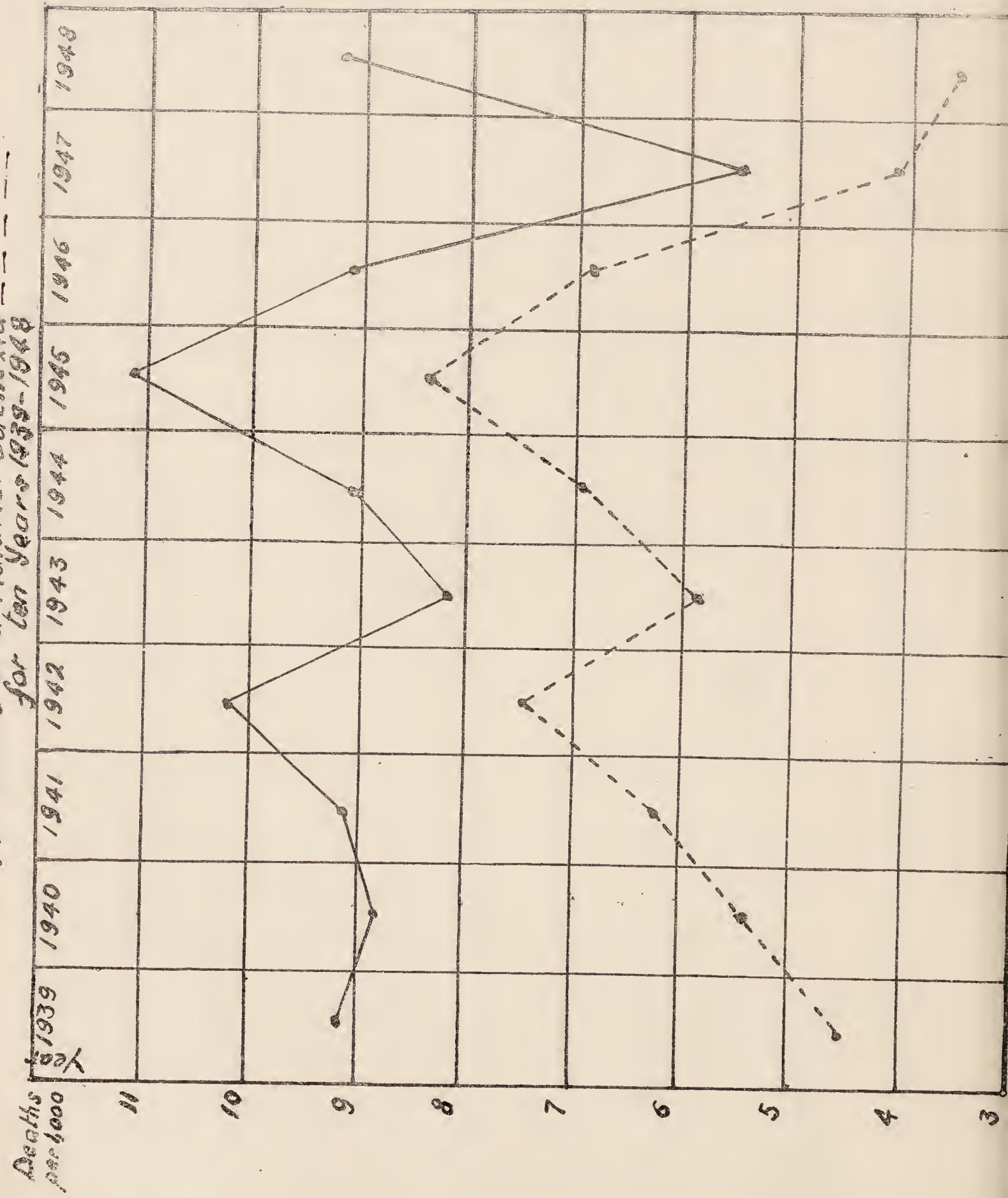


GRAPH B.

DEATHS PER 1,000 OF POPULATION LIVING ASCRIBED TO—

(a) Infective and Parasitic Diseases ———

(b) Malaria and Malarial Cachexia - - - -



The percentage contributions to the total deaths made by the more important groups are shown below—

TABLE III

Group	Percentage of total deaths Ten years 1939-1948									
	1948	1947	1946	1945	1944	1943	1942	1941	1940	1939
1. Infective and parasitic diseases	38.5	27.2	30.8	32.0	33.5	31.3	34.8	35.4	34.8	32.9
4. Diseases of the blood and blood forming organs	4.2	6.6	6.6	5.8	2.2	1.8	2.2	1.6	1.6	1.2
6. Diseases of the nervous system and sense organs	3.5	3.9	3.2	2.6	3.6	3.9	3.4	3.7	4.0	3.5
7. Diseases of the circulatory system and } 16. Senility, old age }	5.5	6.7	5.8	5.3	6.8	7.0	6.1	6.7	5.2	4.5
8. Diseases of the respiratory system	12.5	10.2	9.0	10.0	10.2	12.5	11.4	11.6	12.5	19.0
9. Diseases of the digestive system	10.2	11.8	15.7	14.9	11.8	12.7	12.6	12.3	14.1	12.7
15. Diseases peculiar to the first year of life ...	9.5	13.0	9.5	9.3	10.6	8.0	8.8	8.2	7.3	8.1
18. Ill-defined causes of death	8.1	10.8	10.0	10.5	11.2	12.3	9.1	9.1	9.6	7.6

29. The percentage of deaths due to infective and parasitic diseases shows a distinct downward trend during the past ten years with a sharp rise in 1948 due to a severe epidemic of whooping cough which accounted for 1,729 deaths or 42.6 per cent of the total ascribed to diseases included in this group. The deaths per 1,000 living during the past ten years ascribed to infective and parasitic diseases including malaria and to malaria alone are shown in graphic form (B).

30. Deaths due to diseases of the blood and bloodforming organs rose during the latter years of the war to 6.6 per cent of the total deaths. In 1948 it was still above the prewar percentage (4.2 as compared with 1.6 per cent) which may in part be due to the recognition of macrocytic anæmia in a considerable number of cases which previously were diagnosed as microcytic anæmia due to ankylostomiasis, the deaths having been then included in group I.

31. Deaths from diseases of the respiratory tract show a rise which may be accountable to complications and sequelae of measles which appeared concurrently with whooping cough in the earlier part of the year.

32. Diseases of the digestive system provided a considerably increased proportion of the total deaths during 1945 and 1946 but in 1948 they accounted for the smallest percentage during the past ten years.

33. Population, birth and death rates, and deaths from principal causes in the different districts are shown in Table IV.

TABLE IV
POPULATION, BIRTH AND DEATH RATES, AND DEATHS FROM PRINCIPAL CAUSES IN THE DIFFERENT DISTRICTS
DURING THE YEAR 1948

Districts	Popula- tion	Birth rate*	Death rate*	Malaria	Dysentery	Enteritis and Diarrhoea	Tuber- culosis	Diseases of Respiratory system	Debility† and Old age
Port Louis...	...	47.2	22.4	69	5	111	73	210	60
Pamplemousses	43.4	28.1	187	17	88	29	117	16
Rivière du Rempart	53.3	29.3	179	19	103	14	146	47
Flacq	42.4	28.2	481	13	90	24	105	35
Grand Port	46.1	25.6	199	13	91	23	142	91
Savane	44.1	28.2	112	8	79	17	66	104
Plaines Wilhems	44.7	21.0	153	26	211	65	424	81
Moka	49.9	25.8	52	3	73	12	64	29
Black River	32.7	33.8	148	—	23	12	44	5
WHOLE COLONY	45.4	25.1	1,580	104	869	269	1,318	468

*Rates computed on the basis of the 1944 Census
†Excluding Congenital Debility

INFANT AND CHILD MORTALITY

34. The infantile mortality rate rose sharply to 181·5 per 1,000 live births as compared with 113·9 in 1947, the epidemic of whooping cough to which reference has already been made being primarily responsible.

The deaths under five years of age were distributed as follows—

Age					Males	Females	Total
Under 3 months	..	...	...	...	1,042	845	1,887
3 months and under 6 months	...	...	...	...	365	384	749
6 months and under 1 year	...	...	...	...	449	461	910
1 year and under 2 years	...	...	...	...	401	432	833
2 years	„	3	„	...	207	258	465
3	„	„	4	„	113	128	241
4	„	„	5	„	68	82	150
TOTAL					2,645	2,590	5,235

The principal causes of death in children under five years of age were in the following categories—

Group			under one year	one year and under 5 years
Infective and parasitic diseases	...	...	1,553	976
Diseases peculiar to the first year of life	...	...	1,009	—
Diseases of the Respiratory System...	...	...	449	287
Diseases of the Digestive Sytem	...	...	312	192

COMMUNICABLE AND INFECTIOUS DISEASE

35. Malaria and Antimalarial Measures.

Following upon negotiations between this Government and the Colonial Insecticides Committee in 1947, a visit was paid to the Colony in January 1948 by Mr C. B. Symes, O.B.E. representing the Committee, with a view to making final plans for an experiment the object of which is to determine whether malaria can be eradicated from the island by means of insecticides. Malaria in Mauritius is transmitted by *A. gambiae* and *A. funestus* and the first stage of the experiment is to determine whether these species can be eliminated solely by the spraying of the internal surfaces of all buildings inhabited by human beings and domestic animals.

It was agreed that the Colonial Insecticides Committee would send to Mauritius a research team composed of a medical officer-in-charge, an entomologist, a chemist and six field officers who would be paid from Development Research Funds, all other charges (with the exception of such special equipment as might be required for research purposes) being met from the revenue of the Colony. The expenditure on the experiment which is designed to last two years is estimated at Rs. 3,686,000 of which the Colony's share is in the neighbourhood of Rs. 3,300,000. The research team arrived in Mauritius on the 9th November, 1948, but in the meantime a complete survey had been made of the island and large scale maps of districts and blocks showing all buildings had been prepared to enable operations to commence immediately after the arrival of the team.

It is important to stress the fact that this is an experiment since there will doubtless be a temptation to question whether it is necessary or not to continue to incur expenditure on antimalarial works and on other forms of larval control. If the attempt to exterminate the malaria vectors should prove to be a complete success the problem is solved but unless complete extermination is achieved other measures must needs be continued and it would be improvident, and indeed dangerous, to discontinue other measures of control while *A. gambiae* or *A. funestus* remain. Experience has already shown that to do otherwise may lead to a perilous situation, since the mere spraying of houses will not immediately cause a cessation of breeding under suitable conditions although this may result in the course of time thus after completion of spraying in the areas of Grand Bay and Trou-aux-Biches, the oiling of marshes in these neighbourhoods was temporarily suspended, but mass breeding immediately occurred and it was necessary to revert at once to this method of control.

36. Whatever may be the final result of this experiment, it is appropriate at this stage to give a brief resume of the antimalarial measures carried out before the advent of D.D.T., and to indicate the measure of the results obtained by larvicidal methods.

In 1942 a military organisation was established to control areas in which members of the Forces were stationed. The areas concerned were the towns of Port Louis and Mahebourg, Plaisance Aerodrome, Tombeau Bay and a few isolated posts. Between 1942 and 1944 much work was done in these areas by way of canalising rivers and streams, drainage of marshes and routine maintenance, including regular oiling. The cost of these measures to Mauritius amounted to some Rs. 227,946. In 1945, maintenance of these works was taken over by the Medical and Health Department. Meantime it had become the policy of Government to make a serious effort to bring malaria under control in the island as a whole, and, with this object in view, a small organisation was set up within the department to undertake major and minor works and to provide for routine measures of control and maintenance.

In 1944, works began in Plaines Wilhems and Pamplémousses and in the Bambous area of Black River, four gangs of fifteen men each being employed. A large marsh due to seepage on the northern side of Grand Malabar Hill was drained by a total of over 9,000 feet of main and lateral drains, much of which work involved cutting through solid rock. Again in Plaines Wilhems, 3,700 feet of the river of this name were canalised and a further 10,600 feet which had been damaged by floods in March 1944 were cleared and repaired. In Pamplémousses district, canalising of River Citron was begun with a view to the ultimate draining of the Beau Plan marshes, a perennial massive anopheline breeding ground. At the same time a number of sugar estates had become interested and began to take appropriate measures within their own areas.

The experience gained during this initial period, both by supervisory staff and by labour, enabled the department when additional funds became available in 1945 to extend its activities without difficulty

inasmuch as there was now available a sufficient number of skilled and experienced men in the organisation to take over the supervision of new gangs of workmen. In this year, labour was increased to six gangs of fifteen men; the works begun in Plaines Wilhems and Pamplémousses were continued and, in the case of the former, were extended to include various other rivers and streams.

Concurrently, a change was made in the method of routine maintenance. This had been done by persons called 'Cantonniers' who were in fact job-contractors who undertook to maintain in good order a given stretch of river or stream for which they received Rs. 15 per month; but, apart from the inefficiency of the maintenance, this system took no account of other natural water nuisances affecting the population at risk and some change was clearly indicated. It was found possible to replace the 151 cantonniers in Plaines Wilhems, Moka, Grand Port and parts of Savane and Black River by sixteen gangs, each of one headman and five labourers, employed on a whole time basis at an increased annual cost of only Rs. 1,750; not only were better results obtained but also it was possible to extend considerably the areas under control. This system is now in operation in the majority of populous areas in the Colony.

In 1947, additional credits being available from Development Funds, work proceeded more rapidly. The labour force was increased to 36 gangs of 15 men each, distributed equally among the four districts of Plaines Wilhems, Port Louis, Moka and Pamplémousses, and it is expected that all major works in Plaines Wilhems, Moka, Port Louis and western Pamplémousses will be completed in 1950-51.

In October 1948, the draining of Beau Plan marshes began and this will be completed by June 1949. These marshes, together with the River Citron and its branches, are responsible for the very high endemicity of malaria in Pamplémousses and the surrounding villages where already the spleen rate has fallen from 92 per cent. in 1943 to 50 per cent. in 1948. The parasite rate which in 1943 was 58 was in December 1948, 20 per cent.

37. The following is a summary of the work performed in 1948.

Port Louis :

Major works were carried out on River St Louis, Bain des Dames, Fort Victoria, River Terre Rouge and River Lataniers.

River St Louis.—Situated in the south east of the district, is considered to be at the limit to which antimalarial works affecting Port Louis are required for the present. This river has two branches and two-thirds of its length required canalisation. Works, starting from the junction to the sea, including the first branch, have been completed. The canalisation of the second branch is in progress and will be completed this year.

Bain des Dames.—Salt pans and marshes were the biggest nuisances in this region. Most of the marshes, representing 95 per cent. of the whole extent, have been completely filled in. About 15,000 tons of material were used for that purpose. The remaining 5 per cent. which is on a higher level will be under careful observation during the coming rainy season. If necessary, it will be dealt with in a similar manner.

Fort Victoria.—This fort was surrounded by a very deep trench, which, during summer, was always full of stagnant water. The ditch was filled in before the heavy rains and was regularly inspected; no water now remains.

Those two places constituted the main nuisances affecting the small village of Cassis in the suburb of Port Louis.

In 1942 the spleen rate in this region was 70 per cent. but in 1948 it was 1.1 per cent.

Terre Rouge River.—Situated at the extreme north of Port Louis, has been taken as the northern limit of control for the town. It has been canalised completely from the sea for the required length.

River Lataniers.—Extensive works are being carried out on this river. At certain places, the river has to be regraded through hard rock. Huge boulders have to be removed by hand from the river bed to spots where they cannot be reached by flood waters and rolled back to the river. Where vegetation is dense on the river banks it has to be cut down in order to slope the banks to allow for greater water-carrying capacity.

In general, works in the region consist of laying a concrete bed, sloping the banks to increase the capacity of the river, effecting major improvements to the curves to stop soil erosion and the creation of nuisances by floods.

Plaines Wilhems :

Works were carried out at Le Bosquet, Clairfond marshes, River Eau Bleue and Trianon.

Le Bosquet.—This is a drain dug into solid rock. It is being built with the object of collecting all the waters drained from the north of Beau Bassin. When this work is completed all the small drains and canals of the town will be diverted into this collector.

Clairfond marshes.—Repairs, new works and improvements have been completed. The marshes were drained after the visit of Sir Ronald Ross in 1907, and the works were maintained since. In 1947, the drains had to be recanalised, and at places regraded. This was done. All the french drains were redug and repaired, and many new drains had to be constructed. These works will be beneficial to the towns of Phoenix and Vacoas.

River Eau Bleue.—Canalised in the vicinity of Guimbeau and Antelme marshes which were completely drained last year.

Trianon.—A reinforced concrete water cushion, 110 feet long by 5 feet wide, was constructed, resulting in the abatement of a breeding area at the foot of the Trianon Dam. Previously after heavy showers, the bed of the river was eroded by the water flowing over the dam and a great pool of stagnant water was left behind. Before the rainy season the work was completed and since then, the river has overflowed the dam more than twenty times, without damage to the river bed.

Moka :

Mostly canalisation work was carried out in this district including cleaning and blocking, filling and canalising—

Bonham canal on two-thirds of its surface,
Réduit canal which is now nearly completed,
Bon Air canal which is completed.

Agrément River.—This river ran through a series of marshes all along its course. It had to be filled in at some places and drained. This work is nearly completed.

Chaillet River.—was in a similar condition to Agrément River. About one-third of the work is completed.

Verdun.—River Canet has been canalised from Mon Désert réservoir to Alma Dam. Work is nearly completed.

Sans Souci—Canalisation of Takerel river has been completed.

Pamplemousses :

River Citron.—Canalisation completed up to Grand Bay Road. All the marshy grounds in the vicinity of the river have been dealt with by french drains.

Powder Mills.—All the marshes, drains and tributaries have been completely drained and canalised.

Royal Botanical Gardens.—A small pool has been filled in completely.

Observatory drain and marshes.—completely drained and canalised.

Beau Plan marshes.—About 50 acres have been drained and filled. This was the biggest source of malaria for Pamplemousses village. The land is now capable of being cultivated and in some parts is already under cultivation, evidence that works of this nature have a direct economic as well as a health value.

GENERAL

Major works under Development and Welfare started in May 1947 in the four districts. The percentage of the population in the regions affected by these works is approximately—

					%
Port Louis	...	...	...	...	70
Plaines Wilhems	...	...	...	...	70
Moka	...	...	...	...	50
Pamplemousses	...	...	...	...	30

All works, when completed, are handed over to the maintenance organisation.

38. In the absence of compulsory notification of malaria and of routine blood examinations it is not possible to give precise information of the incidence of this disease but other means of comparing it with previous years are available—

- (a) Reference to graph B will give an indication of the reduction in mortality due to malaria in recent years and graph A shows a record low colony death rate of 20.1 in 1947. Had it not been for the epidemic of whooping cough in 1948, the rate for that year would have been lower still.

- (b) Hospital admissions offer further evidence of the control of malaria. Admissions during the years 1939 to 1943 are illustrated in Graph C.
- (c) Table V shows the deaths from malaria by districts in the years 1943 to 1948. While there has been a general reduction throughout the colony it is significant that this is definitely more marked in those districts in which anti-malarial works have been proceeding on a considerable scale.

TABLE V
DEATHS FROM MALARIA BY DISTRICTS 1943-1948

	1943	1944	1945	1946	1947	1948
Port Louis ...	99	115	79	80	47	69
Pamplemousses ...	346	485	631	474	236	187
Rivière du Rempart ...	195	238	325	239	166	179
Flacq ...	574	617	714	704	491	481
Grand Port ...	430	595	705	509	273	199
Savane ...	120	252	247	257	114	112
Plaines Wilhems ...	263	220	397	337	273	153
Moka ...	177	185	153	106	63	52
Black River ...	203	210	283	212	119	148

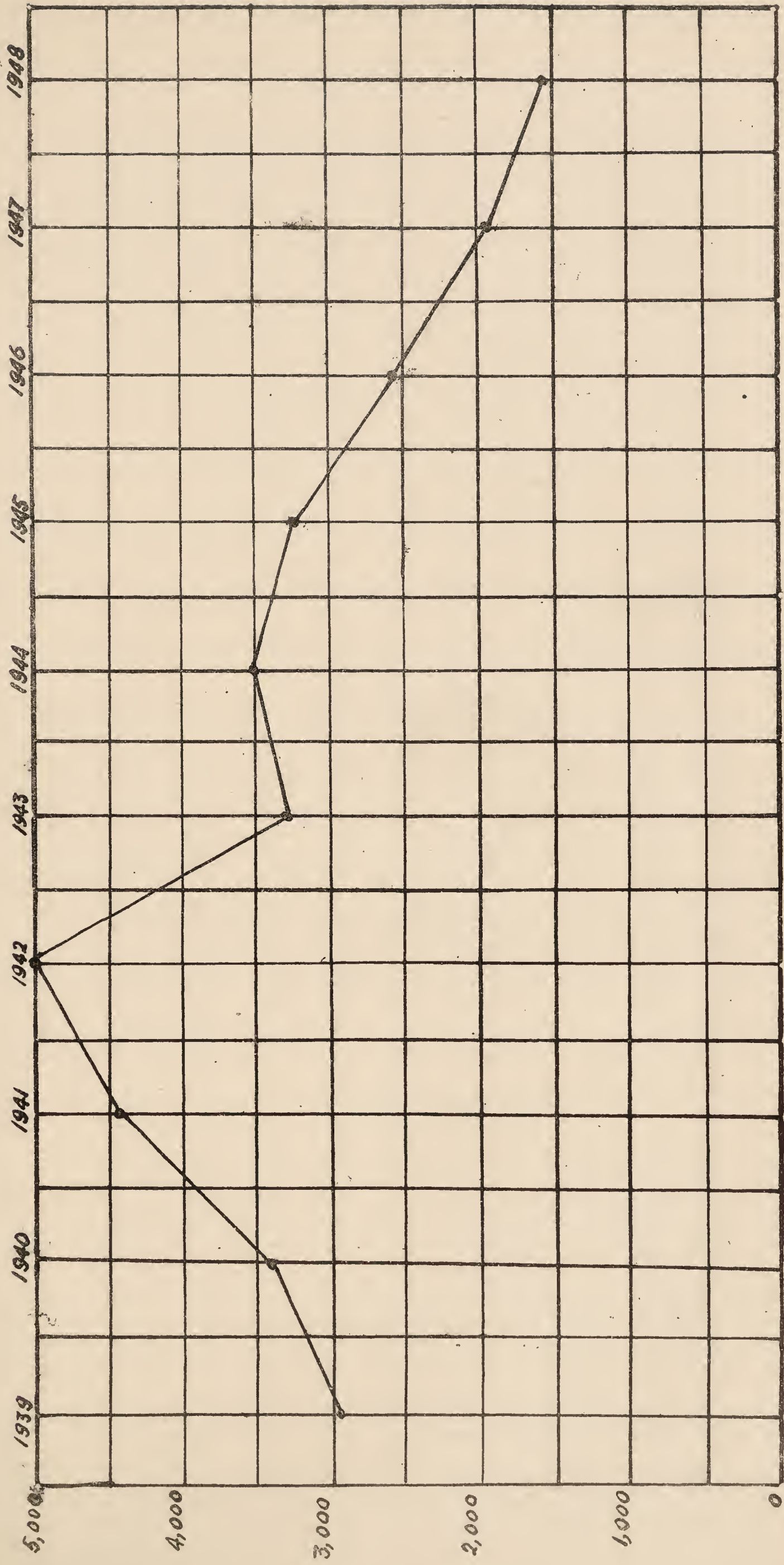
As has been stated above, the districts in which antimalarial works have been carried out are Port Louis, Pamplemousses, Plaines Wilhems and Moka while works carried out by the Admiralty between 1942 and 1945 in Grand Port have been maintained and extended. The following figures (Table VI) reflect the result of works in these districts as compared with others. The year 1943 has been taken for comparison since it was the year of lowest malaria figures in the years immediately preceding the beginning of the campaign.

TABLE VI
DEATHS BY DISTRICTS FROM MALARIA PER 100,000 POPULATION
IN 1943 AND 1948

District	Deaths per 100,000 of District populations at 31st December of each year		Decrease per cent
	1943	1948	
Port Louis ...	174	96	44.8
Pamplemousses ...	988	531	46.2
Plaines Wilhems ...	234	115	50.8
Moka ...	584	211	63.8
Grand Port ...	910	415	54.3
Black River ...	1,642	1,216	25.9*
Rivière du Rempart ...	553	484	12.4
Savane ...	380	329	13.4
Flacq ...	1,119	913	18.4
WHOLE COLONY ...	583	352	39.6

*Maintenance and D.D.T. spraying of internal surfaces of houses in 1947.

Admission to Hospital - Malaria - 1939-1948



(d) The spleen rates taken by the staff of the Malaria Eradication Scheme in December 1948 in localities where regular methods of control have been employed may be compared with those recorded by Sippe and Twining in 1943—

Town or Village	Control measures	Spleen rate%		Parasite rate%	
		1943	1948	1943	1948
Roche Bois	} oiling and simple maintenance ...	80	34.0	57	15.9
Ste. Croix					
Abercombic					
Grand River N.W.	} canalising and maintenance	{ 98 100 }	33.78	85	14.87
Cassis					
Pailles					
Poudre d'Or	... oiling and maintenance ...	84	55.5		
Grand Bay	... oiling and maintenance ...	41	24	36	8
Solitude	... draining, oiling D.D.T. (1947) and Paludrine. ...	70	26	43	4
Pamplemousses	... canalising, draining ...	92	50	58	8
Terre Rouge	... cleaning and oiling ...	95	58	50	20
Plaine Magnien	... do ...	59	30.3	38	6.0
Beau Vallon	... maintenance and oiling ...	52	20	59	15
Mahebourg	... do ...	30	17.5	22	0.0
Ferney	... do ...	91	37.1	66	2.86

39. The Malaria Advisory Board met on six occasions, two being in the nature of field inspections of works in the districts of Plaines Wilhems, Moka, Port Louis and Pamplemousses.

40. *Filariasis*.—40 cases were treated in hospitals and 136 in dispensaries.

41. *Plague*.—No case occurred.

42. *Smallpox*.—H.M.T. Ascanius arrived in the Colony on the 21st July, 1948 with one case of modified smallpox on board. The patient was a King's African Rifleman, one of a draft arriving for the Mauritius garrison. All passengers for Mauritius were detained in the quarantine station for fourteen days. No further case occurred. The necessary measures were taken on board the vessel which was given free pratique and sailed on the 24th July, 1948.

11,473 children were vaccinated by public vaccinators during the year—

Successful vaccinations on first attendance	... 10,541	
Successful vaccinations on second and subsequent attendances	... 590	
	—	11,131
Unsuccessful vaccinations	... 219	
Not observed	... 123	
	—	
TOTAL	... 11,473	

60.26 per cent of children born were vaccinated by public vaccinators. This figure does not include infants vaccinated by private medical practitioners.

43. *Enteric Fever*.—371 cases with 86 deaths were notified as compared with 405 and 87 deaths in 1947. The case fatality was 23.1 per cent as compared with 21.4 per cent in 1947. This figure is high but, generally speaking, only the more serious cases come to light, milder cases escaping notice. The months of highest incidence are October to January.

44. *Diphtheria*.—There were 163 cases notified with 29 deaths. The disease occurs sporadically.

45. Diseases and accidents associated with the Puerperal State. 84 deaths were registered as being due to the puerperal state.

The deaths are classified as under—

Hæmorrhage of childbirth and the puerperium	...	...	8
Infection during childbirth and the puerperium	...	...	6
Puerperal toxæmias	...	...	7
Other diseases and accidents of pregnancy	...	...	18
Other accidents of childbirth	...	...	28
Other and unspecified conditions of childbirth and the puerperium	...	...	17

The maternal mortality rate (the ratio of the number of deaths ascribed to the puerperal state to the total number of births including stillbirths) was 4·13, a record low figure. The rate in 1947 was 5·25 and the mean for the 10 year period 1937–1946 was 10·16.

46. *Erysipelas*.—15 cases were notified, compared with 22 in 1947; 4 deaths were registered.

47. *Tuberculosis*.—Of the 10,518 deaths of 1948, 269 were ascribed to Tuberculosis.

There is as yet no special tuberculosis service although such was envisaged in the Development Plan. In planning such a scheme it is necessary to know the extent of the problem but it has not so far been possible to carry out a survey of the prevalence of this disease. That it is desirable to do so is revealed by the mortality figures for the past twenty years. In 1928, the crude death rate per million of the population was given as 1,351. In 1934, this rate for the first time fell below 1,000, being 880. The trend continued to fall as the following figures show—

Year	Estimated mid-year population	Death rate per million Population from Tuberculosis
1935	394,316	850
1936	397,550	750
1937	399,897	822
1938	402,112	813
1939	405,020	698
1940	406,846	663
1941	407,259	542
1942	407,972	504
1943	410,245	546
1944	419,473	557
1945	423,570	571
1946	424,219	462
1947	432,422	395
1948	441,822	608*

It is clear that a survey of the incidence of this disease is desirable.

*First year of compulsory medical certification of death in towns.

48. *Leprosy*.—No new cases were notified during the year either from Mauritius or Rodrigues.

In the Leper Hospital there were on 1st January 33 male and 16 female patients. Three old patients (male) were readmitted during the year and there were three discharges (one male and two female) and three deaths (two male and one female). The causes of death were terminal enteritis, pulmonary tuberculosis and cardiac failure respectively.

The 46 patients remaining at 31st December may be classified as follows—

				Male	Female	Total
Advanced neural ...	...	...	...	12	4	16
Neural cases of moderate severity	...	...	...	4	1	5
Neural cases of mild severity	...	...	...	4	1	5
Lepromatous (mild)	...	...	...	2	1	3
do (moderate)	...	...	...	3	3	6
do (advanced)	...	...	...	7	3	10
Cured but blind	...	...	...	1	—	1
TOTAL				33	13	46

The Medical Superintendent of the hospital reports on the use of Sulphetrone as follows—

“Towards the end of May 1948 a supply of Sulphetrone was received. Three male and two female lepromatous patients were started on the treatment. A few months later, two very advanced male lepromatous cases, and a similar female case were added to the list, as these patients were rapidly going downhill.

The improvement noted has been very satisfactory in all cases and dramatic in the three advanced cases. The dosage used was three tablets daily (1.5 Grame) for three consecutive weeks with a period of rest of one week after every three weeks.

The drug is well tolerated. At first, the maximum dosage of three tablets daily was reached after a cautious increase from one tablet every other day to the maximum of three tablets daily. But the later cases were so ill, that the maximum dose was reached sooner than in the first series, with no untoward or unpleasant effects.

The rate at which lepromatous nodules flatten out under sulphatrone must be seen to be believed. In one patient, with extensive and large lesions the sites of former lepromatous infiltrations are now marked by hyperpigmented and slightly atrophic patches of skin. In another, extensive erythematous patches of the face and upper extremities cleared up after less than six months treatment.

With the dosage employed, which was not increased because of the favourable results obtained, the only untoward effects noted have been—

- (i) lepra reactions in three patients, of moderate duration and severity,
- (ii) irido-cyclitis (4 attacks in two patients, each having two attacks).’’

49. *Veneral Diseases*—278 cases of admission for syphilis and three deaths from this disease were recorded from the hospitals during the year. 153 cases of gonorrhoea were treated and 39 cases of soft chancre.

50. *Ankylostomiasis*—537 cases were treated in hospitals and 9,794 in the dispensaries, and the number of deaths in hospitals ascribed to this disease was 8.

Work by the Hookworm Unit was confined to weekly treatments at Curepipe. 11,799 treatments were given during the year.

51. *Schistosomiasis*.—91 cases were treated in the hospitals during the year and 360 at the dispensaries.

NUTRITION AND NUTRITIONAL DISEASE.

52. The report for 1948 of the Nutrition Officer is Appended (Appendix III).

The following is a summary of the work done—

(i) *Training*.—Five woman students are being trained at the Teachers' Training College to take posts as "Village HealthWorkers" in rural areas. Their function will be to give help and advice to families in areas cut off from other Welfare services.

(ii) *Supplies*.—A balance sheet of total food supplies and requirements shows an over-all increase in the consumption of some foods, notably rice and fresh milk. The most outstanding features of the balance sheet are the low amount of the vitamins of the B-group available, and the high proportion of Calories obtained from sugar alone. There is still insufficient information available about some sources of supply, mainly locally produced foods, to give a complete picture of the position.

An Inter-departmental Nutrition Committee has been set up to collect information and formulate a general food programme for Mauritius.

(iii) *Food Yeast*.—Food yeast powder imported from Jamaica has been tried successfully in various foods, including bread. It is hoped to find some solution of the problem of distributing the yeast to the general public.

(iv) *Surveys*.—A survey of food consumption has been carried out in the village of Bambous, Black River. A large scale survey of a simple type is planned for 1949, and is intended to obtain information from all representative areas of Mauritius.

(v) *School Meals*.—For six months of the year, the full meal in Grand Port was considerably increased and improved. After this period the meal was modified and reduced, but remained better than the meal given the previous year.

Children having the snack meal were given a new kind of biscuit, made from the residue of groundnuts after extraction of oil. These have proved highly successful.

(vi) *Institutional Feeding*.—Periodic visits have been made to Poor Law institutions and orphanages, and advice and practical help given on feeding problems. Some improvements have been made, although cost has limited the extent to which changes could be made.

An outbreak of pellagra in Beau Bassin prison was investigated, and advice given as to the diet scale.

(vii) *Lecture Courses*.—Lecture courses have been given to sanitary inspectors, social welfare workers and to mothers in child welfare centres.

53. The following deficiency diseases were recorded during the year.

	<i>Total cases treated</i>	<i>in hospital</i>	<i>at dispensaries</i>
Beriberi	4	12
Pellagra	53	166
Scurvy	3	5
Rickets	2	7
Other avitaminoses ...	342		1,278

404

FOOD AND DRUGS IN RELATION TO HEALTH AND DISEASE

54. There are six public and four private abattoirs in the Colony. The public abattoirs administered by the Municipality of Port Louis, the Board of Beau Bassin—Rose Hill, and Curepipe, are each controlled by a veterinary officer. The other abattoirs are conducted under the supervision of the sanitary staff. A new abattoir has been constructed in Flacq district and will be opened when the equipment arrives from the United Kingdom. It may be said that on the whole the foodstuffs marketed are wholesome and of good quality. The only condition found with any frequency in the meat trade is tuberculosis. Cestode infection is uncommon among cattle, and it is very rare in human beings.

Adulteration of milk is a very common offence in spite of sanctions, fines and even imprisonment. In 1948 there were 296 successful prosecutions. Fines imposed amounted to Rs. 16,809 and terms of imprisonment reached the total of 56½ months, 10 weeks and 10 days with and without hard labour.

MATERNITY AND CHILD WELFARE

55. This service is carried out mainly by the Maternity and Child Welfare Society and, in Port Louis by *La Société Pasteur de La Goutte de Lait* administered by the Municipality. The former has 10 centres situated at Curepipe, Rose Hill, Beau Bassin, Vacoas, Henrietta, Quatre Bornes, Centre de Flacq, Rose Belle, Rivière des Anguilles and Mahebourg. The Government grant in 1947 was Rs. 41,000 and Government provides the part-time services of a Superintendent of Midwives and for the training of midwives for the Society. The Society employs 25 midwives. The following is a brief summary of the work done—

Confinements	2,066
Total attendances at Ante and Post natal clinics	2,112
Total attendances of infants for weighing and supervision...	19,842
Visits to infants	2,796
Average number of infants receiving milk daily	922

Three qualified midwives are employed by Government. They made 3,301 visits and attended 571 confinements.

The antenatal clinic at the Civil Hospital in Port Louis which was established in 1947 has proved to be an unqualified success. Numbers attending to begin with were small but notwithstanding, the average weekly attendance for the year was 51. The number of expectant mothers registered was 887 and the total number of attendances in 1948 was 2,673. In addition to routine advice and treatment, women attending this clinic receive dental treatment at the Port Louis dental clinic.

Antenatal clinics were also established during the year in Centre de Flacq, Long Mountain and Camp Fouquereaux.

At all these clinics and at those of the Child Welfare Society, Kahn tests are performed by the staff of the Central Laboratory and antisyphilitic treatment is administered when necessary. During 1948, 970 examinations were made and of these, 87 were positive, 97 weakly positive and 786 negative.

56. The Midwives Board met on two occasions and recommended for consideration of Government a revised scheme of training for midwives and a code of Rules for Midwives based on those of the Central Midwives Board in the United Kingdom. These necessitated an amendment of the Midwives Ordinance (1926) and an amending Bill was introduced to Legislative Council and has since become law as The Midwives (Amendment) Ordinance No. 15 of 1949. The course of training for students in midwifery will be of eighteen months duration. There will be two schools of training, in Civil and Victoria Hospitals, and associated with each there will be a district midwifery service. In addition to the systematic and practical training in the hospitals, students will be required to undergo six months practical work in the district. It is the intention to enrol twenty students in 1949.

SCHOOL MEDICAL SERVICE

57. Reference was made in the annual report of the department for 1947 to an investigation of conditions of school children in the area where school meals had been instituted and the results of this investigation have been published separately. The outstanding features are that—

- (a) The best results are attained by both treatment of disease and feeding the children.
- (b) Second, under the circumstances of the area from which the children come being in a zone where malaria is endemic, by treatment alone.
- (c) The poorest results, subject to the same provision as in (b), were obtained from feeding alone.

Table VII shows the comparative effects of feeding and/or treating school children. Treatment refers to malaria and/or hookworm—

TABLE VII

TABLE OF WEIGHTS TO SHOW THE COMPARATIVE EFFECTS
OF FEEDING AND TREATING SCHOOL CHILDREN

(1) *Receiving neither treatment nor the school meal*

Name of School	Number of children weighed	Percentage increase in weight	Average increase in weight	Percentage decrease in weight	Average decrease in weight
L'Escalier Govt. School	104	62.5	0.57	29.8	0.56
Old Grand Port R.C.A. School ...	43	62.8	0.45	27.9	0.73
Rivière des Créoles Govt. School ...	20	65	0.36	25	0.4

NOTE—The apparent discrepancies between the total percentages is explained by the fact that the remaining children remained stationary in weight.

(2) *Receiving the school meal but no treatment*

Name of School	Number of children weighed	Percentage increase in weight	Average increase in weight	Percentage decrease in weight	Average decrease in weight
L'Escalier Govt. School	104	77.9	0.54	12.5	0.29
Old Grand Port R.C.A. School ...	43	72.1	0.56	18.6	0.52
Rivière des Créoles Govt. School ...	20	75	0.6	5	0.3

(3) *Receiving treatment but no meal*

L'Escalier Govt. School	104	100	0.16	0	0
Old Grand Port R.C.A. School ...	43	100	0.18	0	0
Rivière des Créoles Govt. School ...	20	100	0.37	0	0

(4) *Receiving both treatment and the school meal*

L'Escalier Govt. School	104	92	0.57	5	0.6
Old Grand Port R.C.A. School ...	43	100	0.6	0	0
Rivière des Créoles Govt. School ...	20	100	0.71	0	0

The above figures have been compiled over a period of almost two years and represent various stages in the experimenting in feeding and treating the school children, the same three schools and pupils having been used throughout. All received the same meal but L'Escalier pupils were treated for Hookworm infestation only, the pupils at Old Grand Port for Malaria only, and those at Rivière des Créoles for both Hookworm and Malaria.

The estimated annually recurrent cost of supplying a full meal to all children in primary schools is Rs. 2,300,000—plus a capital expenditure of Rs. 500,000, while a complete school medical service would cost some Rs. 290,000 capital and Rs. 172,000 annually recurrent, making a total annual charge of Rs. 2,472,000. This is a formidable sum and in view of the results of the investigation to which reference has been made, it seems clear that the first objective should be the beginning of a simple school medical service comprising medical attention in the school coupled with follow-up work in the home.

The dental service for the present is limited to Port Louis and caters for scholars of the primary schools, expectant mothers, hospital cases and police. In the course of 496 sessions, treatment was given to 12,258 patients as follows —

Preschool children	...	...	...	825
School children	...	...	...	6,060
Expectant and nursing mothers	...	...	...	732
Hospital cases	{ In-patients	...	...	492
	{ Out-patients	...	...	2,819
Police	...	...	...	794
Military personnel	...	...	...	536 (ceased in 1948)

The nature of treatment was—

Fillings inserted in permanent teeth	...	...	6,057
Permanent teeth extracted	...	...	2,675
Deciduous	...	...	2,075
Treatment of parodontal disease	...	...	2,073
Carcinoma and other tumours of the jaw	...	...	6
Osteomyelitis of the jaw	...	...	50
Luetic cases	...	...	30
Fractures	...	...	8
Other surgical operations of the jaw	...	...	15

PORT HEALTH WORK AND ADMINISTRATION

58. The following table summarises the work done by the Port Sanitary Authority—

Vessels arriving	...	...	...	...	...	...	...	210
Crews examined	...	...	...	...	...	...	...	7,468
Passengers examined	...	...	...	...	...	...	...	3,612
Vessels given pratique on arrival	...	...	...	...	...	...	...	124
Vessels given pratique after disinfection of the linen and effects of the passengers, crew, fumigation and disinfection of the fore-castle	...	...	...	...	...	...	...	66
Vessels given pratique after disinfection of linen, etc., and claytonization of cargo	...	...	...	...	...	...	...	23
Vessels arriving from infected ports	...	...	...	...	...	...	...	86
Vessels detained for purposes of disinfection and fumigation on account of plague, cholera or smallpox	...	...	...	...	...	...	...	1

649 passengers, coming by surface route from infected areas, were put under surveillance.

134 civil aircraft arrived in the Colony with 1,798 passengers. 858 of these passengers, coming from infected areas, were put under surveillance.

59. Statements showing the number of rodents caught and found dead in Port Louis during the year 1948—

Rats	...	...	16,909
Mice	...	...	2,614
TOTAL			19,523

Number of rodents microscopically examined—

Rats	...	...	16,744
Mice	...	...	2,610
TOTAL			19,354

SPECIES OF RATS

Rattus	Rattus	Rattus	...	...	62
..	..	Alexandrinus			14,671
..	..	Frugivorus	...		148
..	..	Norvegicus	...		2,028
TOTAL					16,909

Number of rodents found plague-infected	...	...	...	—
Number of gravid females	...	...	...	356
Number of young ones	...	...	...	1,139
Number of rats found dead	...	...	...	416

GENERAL MEASURES OF SANITATION

60. *Collection and disposal of Refuse.*—There has been a steady, if slow, improvement in the standard of cleanliness in the towns and in many of the rural areas due to improved supervision of services for collection and disposal of refuse resulting from implementing of the scheme for training of sanitary personnel. In Port Louis and the townships of Plaines Wilhems this service is now reasonably good and, given the co-operation of the public, would soon reach a satisfactory standard. Health education is a slow process but the increasing tendency to complain of unsatisfactory scavenging indicates a general awakening to the desirability, if not yet to the necessity, of hygienic surroundings.

Following upon the decision taken in 1947 to substitute scavenging by direct labour in certain areas for the contract system, contracts were not renewed in the villages of Vacoas, Phoenix, Triolet, Terre Rouge, Long Mountain, and Riviere des Anguilles. Of these, the two first named are now dealt with by the department and two others by the Village Councils working under the guidance of the Sanitary inspectorate of the department. The results have been satisfactory and it is hoped that this assuming by the Village Councils of direct responsibility for one of the most important of community services will assist in the development of that sense of civic responsibility which must, or should be, the first step towards local government.

61. *Night Soil and Conservancy.*—The preliminary survey for the sewerage and sewage disposal of the townships of Plaines Wilhems was completed during the year and the scheme awaits approval of Legislative Council. The importance of this scheme cannot be over-emphasised as it will serve the needs of 87,000 of the population of the island and will go far towards controlling water and fly borne diseases which, next to malaria, have been the principal causes of death and illness. The local branch of the British Medical Association has strongly expressed the view that, after malaria control and development of domestic water supplies, this scheme should be given first priority in the development plan of the Colony. Apart from the arguments in favour of the scheme from the health point of view it is not yet generally realised that the proposal is one of economic importance. At present the end-products are lost, but from the sewage farm sufficient water will be made available to irrigate 800 acres of land and fertilizer from sludge to an annual value of some Rs. 8,000 will be obtained.

In rural areas progress continued to be made in supply and maintenance of pit latrines.

62. Progress in sanitation may be judged by the incidence of diseases of the alimentary tract disseminated by flies and water including dysentery, diarrhoea, enteritis, ankylostomiasis and typhoid fever; and the following table showing deaths per 1,000 of the population from these diseases is therefore of interest—

Year	Deaths per 1,000 of the population
1943	3.61
1944	3.50
1945	6.48
1946	5.26
1947	2.43
1948	2.41

It may be noted that the deaths in England and Wales for the year 1946–47 (Report of the Ministry of Health) from enteritis and diarrhoea was 0.121 per 1,000 of the population; the corresponding figure for Mauritius in 1948 was 1.966 deaths per 1,000 of the population. Much, therefore, remains to be accomplished.

63. *Training of Sanitary Personnel*—11 sanitary cadets completed their course of training and qualified as sanitary inspectors. There are now 48 inspectors on the establishment of whom one is undergoing further training in England.

64. *Water Supplies*.—A short outline of the Development and Welfare Plan for Domestic Water Supplies was given in the 1947 Report (para 41).

The progress made in 1948 has been as follows—

Mare-aux-Vacoas system

- (a) The 8" and 7" section of the "Stanley-Plaisance" main was laid and has improved the supplies in the western boundary of Quatre Bornes and Rose Hill. This main will be extended in 1949 to the western limits of Beau Bassin.
- (b) Laying of the 16" section of the new "Vacoas-Moka" main was started although deliveries of pipes has not been completed. This main will supply Moka as well as Montagne Longue, Vallée des Prêtres and Quartier Militaire.
- (c) In Black River a new service main has been laid along the coast road from Tamarin to Black River villages where no supply existed previously. This main at present is supplied from a spring in Tamarin but will eventually be linked up with the Mare-aux-Vacoas Supply.
- (d) Two new filters will be erected in 1949 at La Marie Treatment Works.

District Water Supplies

(a) Construction of Piton du Milieu Storage Reservoir is due to start in July 1949. Pipes are on order for the first section of the Trunk main from the reservoir to the filter beds at Quarter Militaire.

(b) In the North, Goodlands Service Reservoir has been completed and the water main leading to it is being laid. In addition $4\frac{1}{2}$ miles of new main have been laid.

(c) In Central Flacq the supply has been considerably improved by extensive cleaning and re-laying of existing mains which are due to remain in the Development and Welfare Plan. In addition, a new 6" main $2\frac{1}{2}$ miles long has been laid along Rivière Sèche Road to Trou d'Eau Douce where the supply was very defective.

PRISONS

65. Prison hygiene was maintained at a high level.

DEPENDENCY OF RODRIGUES

66. The report of the medical officer is annexed (Appendix IV)

ACKNOWLEDGEMENT

My thanks are due to individual officers of the department for their kind and active co-operation and assistance throughout the year.

A. RANKINE,

Director,

10th August, 1949.

Medical and Health Department

Annual Report of the Bacteriological Laboratory for the year 1948

STAFF

Senior Pathologist	: H. D. Tonking, M.R.C.S. (England) L.R.C.P. (London)
Pathologist	: A. Ng Chhung Hin, M.B., B.Ch., B.A.O (N.U.I.) D.C.P. (London), D.T.M & H. (England).
Government Chemist (Acting)	: R. Avise du Buisson, R.A.C. (Mauritius).
Medical Entomologist	: S. Gébert.
Assistant Government Chemist (Acting)	: J. E. Hervel.
Senior Laboratory Assistant (Pathology)	: L. Webb.
Junior Laboratory Assistant (Pathology)	: K. Topsy.
"	: Mrs. R. Giraud.
"	: Miss A. de Gersigny.
"	: Miss L. Webb.
Laboratory Assistant	: L. Arouff.
"	: Miss M. d'Agnel,
"	: Miss M. Fleuriot.
Clerk	: L. F. Legrigore.

Dr. H. D. Tonking, the Senior Pathologist, returned from overseas leave on 29th February, 1948 taking over from Dr. A. Ng. Chhung Hin who had acted as Senior Pathologist during his absence.

On 7th December Mr. R. Avise du Buisson, Acting Government Chemist, proceeded on overseas leave and Mrs. R. Giraud on 1st December 1948.

The number of specimens dealt with at the Central Laboratory and its branches again showed a marked increase, this had been anticipated as a sequence to the general modernization of the Medical Department and the arrival of recently trained personnel who rightly expect and demand a full laboratory service for their patients.

The following table gives the annual number of examinations carried out by the Central Laboratory and its branches from 1936 the year in which Dr. H. D. Tonking arrived in the Colony—

1936	...	8,278	1943	...	22,024
1937	...	10,009	1944	...	20,818
1938	...	10,625	1945	...	20,572
1939	...	18,492	1946	...	30,784
1940	...	21,343	1947	...	38,308
1941	...	23,135	1948	...	47,827
1942	...	22,533			

As was pointed out in the 1946 Annual Report this has only been possible by a slight increase in staff and in 1949 it is anticipated that a further increase in the number of Laboratory Assistants will be needed.

During the year a new office was made for the Senior Pathologist by closing a section of verandah. The Pathologist now has an office of his own having taken over the room occupied by the Senior Pathologist.

RESEARCH

VETERINARY PATHOLOGY

The cows at the Government Dairy at Curepipe have for a number of years suffered from abortions which at times reached almost epidemic proportions. Numerous efforts have been made in the past to isolate a causative organism from foetuses but it was not until 1947 that a bovine strain of *Brucella abortus* (Bang) was isolated by Mr. Webb from the aborted foetus of a cow "Charlotte 6/7." Mr. Webb succeeded again in 1948 in isolating a second strain from another foetus at the Government Dairy.

As a result of this the sera of all cows at the Government Dairy were tested against a stock strain of *Brucella abortus* from East Africa and also against the newly isolated local strain. Several of the animals showed titres as high as 1 in 2,500. From the results it was found that 15 per cent. of the Dairy Herd were presumptive excretors of *Br. abortus* showing that Contagious abortion exists in the Island.

The local strains were sent to prof. J. C. Cruickshank of the London School of Tropical Medicine and Hygiene who confirmed the findings that the organisms were indeed *Brucella abortus* (Bang) bovine strain.

The sera of the positive reactors were also sent, by the local Veterinary Authorities of the Department of Agriculture, to the Weybridge Laboratories who confirmed our serological findings.

A paper on this subject by J. L. Webb and A. M. Webb has been sent for publication.

HELMINTHOLOGY

In 1945 six hundred egg counts by Clayton Lane's D.C.F. method were carried out on stools submitted to the Central Laboratory the only selection being that the stools should be formed. A standard Clayton Lane centrifuge and tubes were used with a salt solution of 1,200 sp. g. An infection rate of 85 per cent. was found but the average count of the eggs in the positive stools showed an over all average of 485 eggs per gramme of faeces. On dividing the counts into the following groups, it is seen that only six counts of 600 odd could be classed as from cases of really severe hookworm infections while 372, having less than 500 ova per gramme of faeces would be extremely unlikely to have any symptoms caused by their hookworms which if we include the 100 negatives we find that out of 600 persons 472 would most likely not be affected by their helminths and only 43 could be really classed as suffering from hookworm disease.

As a sequel to this work the Senior Pathologist and the Pathologist carried out the following research.

The object of this work was to try to assess the damage done to the labouring classes by hookworms.

The work was divided in two sections, one at the Civil Hospital, Port Louis, and the other at Flacq Hospital. At Port Louis it was decided that all cases, showing hookworm ova by our ordinary routine floatation method, should be examined by Clayton Lane's D.C.F. their erythrocyte count done, their percentage hæmoglobin and a thick drop and a thin smear examined and a note taken of their clinical diagnosis. This it was thought would represent a good cross section of the working people as cases are admitted from all parts of the Island to the hospital.

At Flacq it was decided that cases, diagnosed clinically as hookworm disease by the G.M.O. should have a similar series of examinations to those in Port Louis.

The egg counts on the two groups and the 1945 Central Laboratory counts are given below—

	<i>Less than 500 ova per grm. faeces</i>	<i>500-2000 ova per grm. faeces</i>	<i>2,000-5,000 ova per grm faeces</i>	<i>5,000-10,000 ova per grm. faeces</i>	<i>Over 10,000 ova per grm. faeces</i>	<i>Total</i>
Civil Hospital 1948 {	137 83.54%	22 13.41%	4 2.41%	1 0.61%	Nil —	164
Flacq Hospital 1948 {	37 78.72%	6 12.76%	2 4.26%	2 4.26%	Nil —	47
Central Laboratory 1945 {	372 72.38%	99 19.27%	37 7.18%	4 0.78%	2 0.39%	514

The percentages in each group are remarkably similar considering the different origins of the faeces.

The individual egg counts were then compared with the total erythrocyte counts and the percentage of hæmoglobin of individual cases except in the cases with high egg counts i.e., running into thousands, there were no correlation between the percentage hæmoglobin or the red cell count. It is also significant that the colour indices in both the groups were usually well above unity. The following brief table gives the average figures obtained from the groups: Civil Hospital and Flacq Hospital—

	<i>Civil Hospital</i>	<i>Flacq Hospital</i>
Erythrocytes in millions	2·62	2·17
Hæmoglobin% (Sahli) 14 grms = 100% ...	55	44
Colour Index	1·15	1·05
Average egg count per gramme faeces ...	407	800

Examination of the smears from these cases showed that macrocytes were present in almost every film, microcytes much less so, anisocytosis was fairly marked but poikilocytosis was rare. The picture emerges of nutritional anæmia with, in many cases, a marked tendency to dimorphism.

Following on this work it was decided that an investigation of the school children from various points of the Island was called for. This work was commenced in October but unfortunately had to be suspended owing to the closing of the Schools for an outbreak of poliomyelitis.

Working in conjunction with Dr. J. H. Taylor, the Schools Medical Officer who initiated and made possible this work, an experiment was planned which should include on his side the clinical examination of the child from every aspect i.e., height, weight, age, nutrition, skin, teeth, spleen etc., while from the Laboratory side came the examination of faeces by Clayton Lane D.C.F., percentage hæmoglobin, thick drop, thin smear and erythrocyte count. Up to the end of the year one hundred children from various schools had been examined. Though the work is unfinished so far there is very definite evidence that hookworms play very little if any part in the health of the children; malaria and mal-nutrition would appear to be the two main causes of ill health, out of 100 egg counts by Clayton Lane's D.C.F. not one count of over 300 eggs per gm. of faeces was found. It is hoped that this work will be continued in 1949.

MALARIA RESEARCH

Mosquito dissections.—During 1946, in connection with the D.D.T. experiment in the Black River District, mosquito dissections were carried out on hand caught anophelines. One thousand four hundred and fifty seven. *A. funestus* and fifty *A. gambiae* were dissected with the following results—

	<i>No. dissected</i>	<i>Oocysts</i>		<i>Sporozoites</i>	
		<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
<i>A. funestus</i> ...	1,457	18	1·23	4	0·27
<i>A. gambiae</i> ...	50	—	—	—	—

Apart from obtaining an infection rate the object of this work was to try to explain the fact that in Mauritius though mosquitoes live on the coastal belt, throughout the year, sometimes in great numbers, there is, however, a period of minimum or even non-infectivity, this cold dry period during which it is safe to live at sea level used to be thought to be due to the fact that there were not so many mosquitoes present. That this presumption is fallacious in certain areas has been proved by Mr. Gebert (see later Appendix IV) who found that though the numbers for the anophelines go down a little during mid-winter the insects are always present wherever marshes occur, all round the island at sea level.

As the vectors are present and not hibernating obviously, the explanation must be sought in the development of the malaria parasite in the mosquito. The temperature during the cold months being such that either the sporozoites are not sufficiently active or that the developmental stage in the mosquito takes too long for the average insect to become infective during its life.

It was noticed during the dissections that no infective mosquitoes were found before the middle of September, thus in 1,200 mosquitoes dissected from June to the 16th September, no sporozoites were found but frequently oöcysts in various stages of development were found in the stomach walls.

In April 1947, mosquitoes hand caught in Black River District by Mr. Gebert to the number of ninety gave three with oöcysts and two with sporozoites, an infection rate of 5.6 per cent.

In September 1948 mosquito dissections were again started on mosquitoes from the same region and even in many cases from the same houses as had been carried out in 1946 and 1947, and on the 22nd September the first sporozoites were found. Sporozoites have continued to be found up to the end of the year. In all some 625 *A. funestus* were dissected with the following results—

		No. dissected	Oocysts		Sporozoites	
			No.	%	No.	%
<i>A. funestus</i>	...	625	17	2.72	6	0.96

To conclude: the information gleaned from the dissections to date is: Infective mosquitoes are found from the middle of September to December and through April. No infective mosquitoes have been found as yet from June to September.

To correlate this work with the temperature, a maximum and minimum thermometer (lent and tested by the Meteorological Department) has been placed in a typical thatched dwelling in the district in which the mosquitoes were caught and 24 hourly maximum and minimum temperatures taken.

This work is incomplete and should the work of the Malaria Eradication Scheme prove successful it will never be completed in Mauritius, an end which is ardently to be hoped for.

All the mosquitoes dissections were carried out by Mr. L. Webb and Mr. J. Hervel during overtime work.

During the year 5,806 thick drops were examined from various sources. These were done by Mr. Webb and Mr. Hervel during overtime. Records were kept by Mr. Legrigore during his overtime.

On the arrival of the Malaria Eradication Scheme personnel, the Senior Pathologist delivered a series of talks on Malaria in Mauritius to the Field Overseers.

Training of the three laboratory learners for the diagnosis of malaria in blood was also started and at the same time the Malaria Research rooms were put at the disposal of the Entomological Branch of the Scheme until such time as their own laboratories should be completed.

It was observed during the survey carried out by Dr. Dowling in 1948 that the slides showing parasites, apart from being many fewer in number than in the 1942 survey, also showed a much lighter degree of parasitization of the blood. This led, as only thick drops were examined, to a high percentage of cases reported as "Unidentified Rings" as after considerable search often only one or two ring forms could be found.

These findings bear out the work of the Medical Entomologist who states that the anopheline population has decreased considerably in the last few years owing to abnormal drought conditions. There is no doubt from all available evidence that malaria has declined during the last three years throughout all the malarious parts of the Island.

LABORATORY RECEIPTS IN THE FORM OF FEES

The total earnings for the year amounted to Rs. 12,920.77.

ROUTINE EXAMINATIONS

A total of 22,146 examinations exclusive of those made in connection with the D.D.T. experiment (6,431) and of the Chemical Division which carried out 3,875 examinations (Appendix I) and of the Branch Laboratories (Appendices II and III).

The work of the Laboratory is divided up into the following sections—

- | | |
|-------------------------|---------------------------|
| (i) Medical Biological. | (iv) Haematology. |
| (ii) Pathology. | (v) Serology. |
| (iii) Bacteriological. | (vi) Laboratory Products. |

I. MEDICAL BIOLOGICAL

A. 5,270 SIMPLE ROUTINE EXAMINATIONS WERE MADE

(a) *Blood (Microscopical)*

Films for malaria :

<i>Plasmodium malariae</i>	...	...	...	...	...	16
<i>Plasmodium vivax</i>	...	...	...	...	...	30
<i>Plasmodium falciparum</i>	...	...	...	...	...	67
Undetermined rings	...	...	...	...	...	24
No parasites found	...	...	...	...	...	263

Films for microfilariæ :

<i>Wuchereria bancrofti</i>	...	...	...	...	...	28
No microfilariæ	...	...	...	...	...	93

Films for trypanosomes (rats) :

<i>Trypanosoma lewisi</i>	52
No parasites found	80

TOTAL	653
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(b) *Faeces (Microscopical)*

Total number examined	2,766
Helminths :						
<i>Bertiella stnderi</i>	3
<i>Taenia saginata</i>	...	...	...	...	...	1
<i>Ascaris lumbricoides</i>	...	...	...	...	...	1
<i>Enterobius vermicularis</i>	...	...	...	...	...	1
Trichuris ova	...	...	...	...	...	1,286
Ascaris ova...	...	...	...	...	...	328
" Hookworm " ova	...	...	...	...	...	1,191
Strongyloides larvae	...	...	...	...	...	139
Trichostrongyle ova	...	...	...	...	...	14
<i>Enterobius vermicularis</i> ova	...	...	...	...	...	13
<i>Isopora hominis</i> ova	...	...	...	...	...	1
<i>Angiostrongylus vasorum</i> ova	...	...	...	...	...	1
<i>Heterodera radicicola</i> ova	...	...	...	...	...	7
Tapeworm ova	...	...	...	...	...	2

Protozoa :

<i>Entamoeba histolytica</i>	...	...	...	...	...	147
<i>Entamoeba coli</i>	...	...	...	...	...	174
Vegetative and precystic entamoebae	...	...	...	...	...	91
<i>Iodamoeba butschlii</i>	...	...	...	...	...	1
<i>Endolimax nana</i>	...	...	...	...	...	185
<i>Giardia intestinalis</i>	...	...	...	...	...	117
<i>Trichomonas intestinalis</i>...	...	...	...	...	...	87
<i>Chilomastix mesnili</i>	...	...	...	...	...	59
<i>Blastocystis hominis</i>	...	...	...	...	...	626
<i>Dientamoeba fragilis</i>	...	...	...	...	...	1
<i>Balantidium coli</i>	...	...	...	...	...	1
No helminths or protozoa	...	...	...	...	...	569

(c) *Urine (Microscopical)*

Total number examined	...	...	...	...	...	1,306
Hyaline casts	...	...	...	...	...	232
Granular casts	...	...	...	...	...	190
Waxy casts	...	...	...	...	...	28
Leucocytic casts	...	...	...	...	...	48
Red cells casts	...	...	...	...	...	3
Cellular casts	...	...	...	...	...	35
<i>Schistosoma haematobium</i>	...	...	...	...	...	78
<i>Trichomonas vaginalis</i>	...	...	...	...	...	14
Microfilaria	...	...	...	...	...	1

I. MEDICAL BIOLOGICAL—*continued*(d) *Cerebro-spinal Fluid*

Total number examined ...	...	...	...	...	85
Leucocyte counts ...	...	...	...	...	81
Differential leucocyte counts ...	...	...	...	...	7
Nonne Apelt test ...	...	...	...	...	22

(e) *Pus, Discharges and Scrapings, etc. (Microscopical)*

Total number examined ...	...	...	...	...	5
Fungus ...	...	...	...	...	3

(f) *Miscellaneous. (Microscopical)*

Eimeriae stiedae (rabbit)...	...	...	...	...	19
<i>Pediculus corporis</i> in garments ...	...	...	...	...	1
Oestrus ovis from eye ...	...	...	...	...	1
Test for potency of insulin ...	...	...	...	...	1

Rats :

Spleen smears for <i>B. pestis</i> —negative ...	...	...	...	292
Diaphragm for larvae of <i>Trichinella spiralis</i> —negative	...	...	...	141

II. PATHOLOGY

Morbid histological examinations were made on 119 specimens of material.

HEAD AND NECK :

Scalp : haemangioma hypertrophicum...	...	...	...	1
Ear : Keloid ...	...	...	...	1
Eyes : Adenoma ...	...	...	...	1
Eyelid : Papilloma ...	...	...	...	1
Cheek : Carcinoma ...	...	...	...	1
Gum : Granuloma ...	...	...	...	1
Neck : Papilloma ...	...	...	...	1
Larynx : Carcinoma ...	...	...	...	1
Inflammation ...	...	...	...	1

THORAX :

Breasts Scirrhus Carcinoma ...	...	...	...	2
Fibroadenoma ...	...	...	...	1
Colloid Carcinoma ...	...	...	...	1
Encephaloid Carcinoma ...	...	...	...	1
Chronic cystic mastitis ...	...	...	...	1
Lungs : Congestion ...	...	...	...	1
Heart : Normal ...	...	...	...	1

ABBOMEN :

Abdominal wall : Fibrosarcoma ...	...	...	...	1
Diaphragm : Granuloma ...	...	...	...	1
Stomach : Scirrhus carcinoma ...	...	...	...	5
Adenocarcinoma ...	...	...	...	2
Chronic Ulcer ...	...	...	...	1
Liver : Acute haemorrhagic necrosis ...	...	...	...	1
Patchy necrosis ...	...	...	...	1
Tuberculoma ...	...	...	...	1
Small intestine : Chronic inflammatory ulcer ...	...	...	...	1
Appendix : Chronic appendicitis ...	...	...	...	1
Caecum : Hypertrophic tuberculosis ...	...	...	...	1
Infective granuloma ...	...	...	...	1
Spleen : Chronic venous congestion ...	...	...	...	1
Anus : Papilloma ...	...	...	...	3

UPPER LIMBS :

Arm : Epithelioma ...	...	...	...	1
Hand : Epithelioma ...	...	...	...	1
Compound palmar ganglion ...	...	...	...	1

II. PATHOLOGY—*continued*

LOWER LIMB :

Chronic inflammation	...	...	...	...	...	1
Sarcoma	...	...	...	...	...	1
Fibrosarcoma	...	...	...	...	...	2
Papilloma	...	...	...	...	...	1
Chronic infected cyst of knee	...	...	...	...	...	1
Gouty toe	...	...	...	...	...	1

BONE :

Plasmacytoma	...	...	...	...	...	1
Exostosis	...	...	...	...	...	2
Normal	...	...	...	...	...	1
Osteitis fibrosa	...	...	...	...	...	1
<i>Bone marrow</i> : Lymphocytosis	...	...	...	...	...	1
<i>Cartilage</i> Normal	...	...	...	...	...	1

JOINTS :

<i>Hip</i> : Chronic suppurative arthritis	...	...	...	...	1
<i>Synovial membrane</i> : Chronic inflammation	...	...	...	...	1

GENITO-URINARY SYSTEM :

<i>Uterus</i> : Normal endometrium	...	...	...	...	5
Squamous celled carcinoma	...	...	...	...	1
Adenocarcinoma	...	...	...	...	1
Aplastic carcinoma	...	...	...	...	1
Adenomatosis	...	...	...	...	1
Chronic endometritis	...	...	...	...	1
Chronic cervicitis	...	...	...	...	1
Fibromyoma	...	...	...	...	3
Products of Abortion	...	...	...	...	2
<i>Fallopian tubes</i> : Chronic inflammation	...	...	...	...	1
<i>Ovaries</i> : Benign cysts	...	...	...	...	5
<i>Penis</i> : Squamous celled	...	...	...	...	1
<i>Testes</i> : Fibrosis of epididymis	...	...	...	...	1
Seminoma	...	...	...	...	1
<i>Vulva</i> : Epithelioma	...	...	...	...	1
Papilloma	...	...	...	...	1
<i>Axilla</i> : Simple cyst ? origin	...	...	...	...	1
<i>Lymph glands</i> : Reticulosarcoma	...	...	...	...	1
Secondary carcinoma	...	...	...	...	1
Hodgkin's disease	...	...	...	...	3
Chronic inflammation	...	...	...	...	5
Tuberculosis	...	...	...	...	2
<i>Muscles</i> : Muscular contracture	...	...	...	...	2
Rhabdomyoma	...	...	...	...	1
Muscle sheath chronic inflammation	...	...	...	...	1
<i>Nerves</i> : Fibrous infiltration	...	...	...	...	3
<i>Blood vessels</i> : Endarthritis obliterans	...	...	...	...	8
<i>Presacral region</i> : Fibromyoma	1
<i>Gluteal region</i> : Mucoid cyst	1

ANIMALS :

DOG :

<i>Brain</i> : Normal	1
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RAT :

<i>Lung</i> : Rhabtidiform larvae of ? hookworm	1
<i>Liver</i> : Ova of <i>Capillaria hepatica</i>	2

CALF :

<i>Lung</i> : Tubercle bacilli	1
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III. BACTERIOLOGICAL

A. 1,274 MICROSCOPICAL EXAMINATIONS WERE MADE

(a) *Sputum (Microscopical)*

Total number examined	...	...	...	...	...	863
<i>Mycobacter. tuberculosis</i>	...	...	...	...	...	139
Pneumococci	...	...	...	...	...	1

III. BACTERIOLOGICAL—continued

(b) *Cerebro-spinal Fluid (Microscopical)*

Total number examined	...	...	...	...	...	20
Pneumococci	...	...	...	...	...	1
Staphylococci	...	...	...	...	...	2

(c) *Throat and Nasal Swabbing, (Microscopical)*

Total number examined	...	...	...	...	...	237
<i>Corynebact. diphtheriae</i>	...	...	...	...	...	31
Vincent fusiform organisms	...	...	...	...	...	9
<i>Mycobacter, tuberculosis</i>	...	...	...	...	...	1
<i>Bact. proteus</i>	...	...	...	...	...	1

(d) *Pus, Discharges and Scrapings, etc., (Microscopical)*

Total number examined	...	...	...	...	...	174
<i>Corynebact. diphtheriae</i>	...	...	...	...	...	1
<i>Neisseria gonorrhoeae</i>	...	...	...	...	...	26
Streptococci	...	...	...	...	...	2
Staphylococci	...	...	...	...	...	2
<i>Mycobacter tuberculosis</i>	...	...	...	...	...	1

B. 3,125 CULTURAL EXAMINATIONS WERE MADE

(a) *Blood*

Total number cultured	...	...	...	...	...	57
<i>Bact. typhosum</i>	...	...	...	...	...	1
<i>Bact. coli</i>	...	...	...	...	...	2
<i>Bact. alkaligenes</i>	...	...	...	...	...	6
<i>Bact. friedlanderi</i>	...	...	...	...	...	2
Streptococci	...	...	...	...	...	1
Staphylococci	...	...	...	...	...	15

(b) *Faeces*

Total number cultured	...	...	...	...	...	333
<i>Bact. typhosum</i>	...	...	...	...	...	28
<i>Bact. dysenteriae</i> (Sonne)	...	...	...	...	...	1
<i>Bact. coli (anaerogenes)</i>	...	...	...	...	...	1
<i>Bact. coli</i>	...	...	...	...	...	1
<i>Bact. proteus</i>	...	...	...	...	...	1

(c) *Urine*

Total number cultured	...	...	...	...	...	350
<i>Bact. coli</i>	...	...	...	...	...	147
<i>Bact. coli anaerogenes</i>	...	...	...	...	...	5
<i>Bact. coli</i> (atypical)	...	...	...	...	...	5
<i>Bact. alkaligenes</i>	...	...	...	...	...	4
<i>Pseudomonas pyocyanea</i>	...	...	...	...	...	3
<i>Bact. paracolon</i>	...	...	...	...	...	6
<i>Bact. proteus</i>	...	...	...	...	...	8
<i>Bact. paratyphosum A</i>	...	...	...	...	...	1
<i>Bact. enterococci</i>	...	...	...	...	...	4
Streptococci	...	...	...	...	...	17
Staphylococci	...	...	...	...	...	14
Inoculation to guinea-pig for <i>mycobacter tuberculosis</i>	...	...	...	...	...	6
Friedman's test for pregnancy	...	...	...	...	...	11

(d) *Sputum*

Total number cultured	...	...	...	...	...	11
Pneumococci	...	...	...	...	...	2
Streptococci	...	...	...	...	...	5
Staphylococci	...	...	...	...	...	1

III. BACTERIOLOGICAL—*continued*(e) *Cerebro-spinal Fluid*

Total number cultured	...	...	...	...	...	...	37
<i>Bact. coli</i>	...	...	...	...	...	...	3
<i>Haemophilus influenzae</i> (Pfeiffer)	...	...	...	...	...	...	1
<i>Bact. friedlanderi</i>	...	...	...	...	...	...	1
<i>Bact. proteus</i>	...	...	...	...	...	...	2
<i>Pneumococci</i>	...	...	...	...	...	...	7
<i>Bact subtilis</i>	...	...	...	...	...	...	4
Streptococci	...	...	...	...	...	...	1
Staphylococci	...	...	...	...	...	...	8

(f) *Throat and Nasal Swabbings*

Total number cultured	...	...	...	...	...	...	1,834
<i>Corynebact. diphtheriae</i>	...	...	...	...	...	...	177
<i>Bact. friedlanderi</i>	...	...	...	...	...	...	1
<i>Diphtheroids</i>	...	...	...	...	...	...	7
Streptococci	...	...	...	...	...	...	72
Staphylococci	...	...	...	...	...	...	32
Virulence tests for <i>corynebact diphtheriae</i>	...	...	...	...	...	...	9

(g) *Pus, Discharges and Scrapings, etc.,*

Total number cultured	...	...	...	...	...	...	473
<i>Haemophilus influenzae</i> (Pfeiffer)	...	...	...	...	...	...	1
<i>Bact. friedlanderi</i>	...	...	...	...	...	...	2
<i>Bact coli</i>	...	...	...	...	...	...	13
<i>Bact. coli</i> (atypical)	...	...	...	...	...	...	16
<i>Pseudomonas pyocyanea</i>	...	...	...	...	...	...	2
<i>Diphtheroids</i>	...	...	...	...	...	...	20
<i>Bact proteus</i>	...	...	...	...	...	...	2
Streptococci	...	...	...	...	...	...	16
Staphylococci	...	...	...	...	...	...	266
Inoculation to guinea pig for <i>mycobacter tuberculosis</i>	...	...	...	...	...	...	4

C. AUTOGENOUS VACCINES WERE PREPARED FROM THE FOLLOWING
ORGANISMS ISOLATED, AMONG OTHERS, FROM VARIOUS
SAMPLES, 47 IN ALL

(a) *Faeces*

Endo vaccine	1
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(b) *Urine*

<i>Bact. coli</i>	3
<i>Bact. paracolon</i>	1
Staphylococci	1

(c) *Sputum*

Streptococci	4
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(d) *Throat and Nasal Swabbings, etc.,*

<i>Bact. friedlanderi</i>	1
Staphylococci	2
Streptococci	2

(e) *Pus, Discharges, Scrapings, etc.,*

Staphylococci	...	...	...	...	...	...	30
<i>Bact friedlanderi</i>	...	...	...	...	...	...	1
<i>Bact. coli</i>	...	...	...	...	...	...	1
<i>Pseudomonas pyocyanea</i>	...	...	...	...	...	...	1

VI. LABORATORY PRODUCTS

47. Autogenous vaccines were prepared during 1948 ; details of which will be found under Bacteriology—

T.A.B. vaccine prophylaxis ...	...	...	...	9 litres
T.A.B. vaccine protein shock ...	...	...	...	1 litre
Besredka's staphylococcal antiviral ...	...	...	...	10 litres
Besredka's streptococcal antiviral ...	...	...	...	6 „

A Strain of *Lactobacillus bulgaris* was maintained.

CONCLUSION

I should like to thank all members of the staff for their loyal co-operation throughout the year.

H. D. TONKING,

25th March, 1949.

Senior Pathologist.

Appendix I

Annual Report of the Government Chemist for the Year 1948

STAFF

Government Chemist (Acting) : R. Avice du Buisson R.A.C. (Mauritius)
Assistant Government Chemist (Acting) : J. E. Herval.

During his actingship, Mr. R. Avice du Buisson was appointed member of the Committee of Enquiry to investigate all aspects of the Country Liquor Industry in Mauritius.

On the 6th December, Mr. Avice du Buisson went on overseas leave and the post was left vacant up to the end of the year.

During the year, 3,875 samples were received for examination. The work done comprised routine and research works for the following Department : Medical and Health, Police, Customs and Excise, Agriculture, Supplies Control Board, Municipality of Port Louis, etc.

This report is divided in the following sections—

- I. Biochemical
- II. Public Health
- III. Customs and Excise
- IV. Forensic
- V. Miscellaneous.

I. BIOCHEMICAL

The following examinations were made on 2,433 samples received.

(a) Blood

				Specimen
Van den Bergh reaction ...	...	...	...	3
Estimation of urea ...	...	...	...	849
„ glucose ...	...	...	...	673
„ chlorides ...	...	...	...	30
„ cholesterol ...	...	...	...	3
TOTAL ...				1,558

6 more samples were received!but were?unsuitable for tests.

(b) *Urine*

	<i>Specimens</i>		
Qualitative clinical analysis	682
,, examination for acetone	24
,, biliary pigments	13
Quantitative estimation of sugar	127
,, ,, albumen	9
,, ,, chlorides	1
Erlich Diazo-reaction	2
TOTAL	858

(c) *Faeces*

	<i>Specimens</i>		
Examination for occult blood	2
Examination of fats	3

(d) *Urinary calculus*

Composition required	1
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(e) *Cerebro-spinal fluid*

Determination of protein	8
,, chlorides	2
,, urea	1
TOTAL	11

II. PUBLIC HEALTH

618 following samples were received and examined.

	<i>Specimens</i>					
Fresh milk	373
Water	47
Medicinal preparations	139
D.D.T. solution	11
Butter	3
Ghee	2
Bread	2
Foodstuffs	29
Soap	1
Oil	7
Flour	4

Milk—From results of analysis it is observed that 81% of the samples received were found to be watered. This figure, in fact, is very high in spite of the severe control made by Sanitary Inspectors on milk sellers.

The percentage of boiled Milk is 5.6 and that of skimmed milk 12.3. Here again, the figures though low, proved the intention of milk sellers to deprive the milk of its fat to the disadvantage of consumers.

The figure for the addition of sugar in milk is 2.1 per cent.

Water—44 samples were examined for drinking purposes. Samples were taken monthly at Monneron, Pailles and La Marie.

3 samples were received from Flat Island sent by the Land Settlement Officer, Department of Agriculture. They were analysed as for their fitness for drinking purposes.

III. EXCISE AND CUSTOMS

525 samples of alcohol were received and examined as follows :

149 samples were tested for presence of furfuraldehyde.

376 samples were tested for acidity—to be used as power alchool.

IV. FORENSIC

The following examinations were carried out:

(a) *Medico-Legal*

Poisoning ... 26 exhibits in 19 cases

Specimens consisting of human and animal origins.

(b) *Revenue of Offences*

Illicit distillation ...	32 exhibits in 12 cases
Illegal possession of rum ...	99 39 "
Country liquor ...	5 5 "
Other various offences ...	17 17 "
TOTAL ...	153 73

(c) *Dangerous Drugs*

Gandia ...	26 exhibits in 23 cases
Opium ...	35 20 "
TOTAL ...	61 43

V. MISCELLANEOUS

12 samples were received and examined—

	Samples
Coal tar ...	5
Tissue ...	1
Alcohol for inflammable vapour ...	2
Paint ...	1
Coins ...	2
Denatured spirits ...	1

The samples of coal tar forwarded by the Customs Department were analysed as for their classification for duty purposes.

The sample of paint was received from the Customs Department and the view of the analysis was to find out whether it should be classed as "Paint" or "Varnish liquid of all kinds."

The 2 samples of coins were forwarded by the Police Medical Officer, Port Louis, as to their quantitative composition.

R. RIVALLAND.

Acting Government Chemist.

25th March, 1949.

Annual Report of the Civil Hospital Branch Laboratory for the year 1948

I. MEDICAL BIOLOGICAL

5,587 simple routine clinical examinations were made.

(a) *Blood (Microscopical)*

Total number examined ...	521
Films for malaria :	
<i>Plasmodium vivax</i> ...	4
<i>Plasmodium falciparum</i> ...	22
Undetermined rings ...	24
No parasites found ...	431
Films for microfilariae :	
<i>Wuchereria bancrofti</i> ...	3
No microfilariae ...	37

(b) *Faeces (Microscopical)*

Total number examined	...	...	...	3,089
Helminths :				
Trichuris ova	...	...	...	490
Ascaris ova	...	...	...	222
' Hookworm ' ova	...	...	...	918
<i>Enterobius vermicularis</i> ova	...	...	...	6
Trichostrongyle ova	...	...	...	2
Strongyloides larvae	...	...	...	59
<i>Clonorchis sinensis</i> ova	...	...	...	7
Protozoa :				
<i>Entamoeba histolytica</i>	...	...	...	171
<i>E. Coli</i>	...	...	...	61
Vegetative and precystic entamoebae	...	...	...	94
<i>Endolimax nana</i>	...	...	...	49
<i>Giardia intestinalis</i>...	...	...	...	87
<i>Chilomastix mesnili</i>	...	...	...	28
<i>Blastocystis hominis</i>	...	...	...	212
<i>Trichomonas intestinalis</i>	...	...	...	102
No helminths or protozoa	...	...	...	1,113

(c) *Urine (Microscopical)*

Total number examined	...	...	...	1,974
Hyaline casts	...	...	...	127
Granular casts	...	...	...	282
Waxy casts	...	...	...	58
Cellular casts	...	...	...	21
Leucocytic casts	...	...	...	37
Red blood cells casts	...	...	...	12
<i>Schistosomum haematobium</i>	...	...	...	178
<i>Trichomonas vaginalis</i>	58

(d) *Cerebro-spinal fluid, (Microscopical)*

Leucocyte counts	3
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II. BACTERIOLOGICAL

1,666 microscopical examinations were made.

(a) *Sputum (Microscopical)*

Total number examined	...	...	...	1,116
<i>Mycobacter, tuberculosis</i>	...	...	...	205

(b) *Nasal and Throat Swabbings (Microscopical)*

Total number examined	...	...	...	103
<i>Corynebact. diphtheriae</i>	...	...	...	24
Vincent's Organisms	...	...	...	4

(c) *Pus, Discharges and Scrapings, etc.*

Total number examined	...	...	...	447
<i>Neisseriae gonorrhoeae</i>	...	...	...	70
Pneumococci	...	...	...	5
<i>Trichomonas vaginalis</i>	...	...	...	1

III. HAEMATOLOGY

ROUTINE BLOOD EXAMINATION

Total number examined	...	...	...	1,084
Total counts of red and white cells and haemoglobin determinations	...	...	...	711
Differential leucocyte counts	...	...	...	360
Blood typing	...	...	...	13

IV. BIOCHEMICAL

Total number examined	...	...	...	2,024
Total number of Examinations :	10,361			

Appendix III

Annual Report of the Victoria Hospital Branch Laboratory for the year 1948

I. MEDICAL BIOLOGICAL

(a) Blood (Microscopical)

Films for malaria :

<i>Plasmodium malariae</i>	...	...	...	3
<i>Plasmodium vivax</i>	...	...	...	11
<i>Plasmodium falciparum</i>	...	...	...	29
No parasites found	...	...	...	440

Films for microfilariae :

<i>Wuchereria bancrofti</i>	6
No microfilariae	62

TOTAL	551
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(b) Faeces (Microscopical)

Total number examined	1,560
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Helminths :

Trichuris ova	389
Ascaris ova	213
' Hookworm ' ova	663
Strongyloides larvae	27
<i>Enterobius vermicularis</i> ova	...	...	...	1
<i>Heterodera radicum</i> ova	...	...	...	5

Protozoa :

<i>Entamoeba histolytica</i>	...	...	...	32
<i>Entamoeba coli</i>	...	...	...	7
Vegetative and precystic amoebae	...	...	...	50
<i>Endolimax nana</i>	...	...	...	14
<i>Giardia intestinalis</i>	...	...	...	35
<i>Trichomonas intestinalis</i>	...	...	...	63
<i>Blastocystis hominis</i>	...	...	...	266
<i>Chilomastix mesnili</i>	...	...	...	13
No helminths or protozoa	...	...	...	481

(c) Urine (Microscopical)

Total number examined	...	...	...	1,009
Hyaline casts	...	...	...	39
Granular casts	...	...	...	301
Blood casts	...	...	...	3
Leucocyte casts	...	...	...	17
Cellular casts	...	...	...	5
Waxy casts	...	...	...	1
<i>Schistosoma haematobium</i> ova	...	...	...	44
<i>Trichomonas vaginalis</i>	..	...	...	13

II. BACTERIOLOGICAL

(a) Sputum (Microscopical)

Total number examined	...	...	...	479
<i>Mycobacter tuberculosis</i>	...	...	...	49

(b) Nasal and Throat Swabbings (Microscopical)

Total number examined	...	...	...	5
<i>Corynebact diphtheriae</i>	...	...	...	2

(c) *Pus, Discharges, etc, (Microscopical)*

Total number examined	...	...	...	103
<i>Neisseriac gonorrhoeae</i>	...	...	...	23

(d) *Cerebro-spinal fluid (Microscopical)*

Total number examined	...	...	...	3
Streptococci	...	...	...	1

III. HAEMATOLOGY

ROUTINE BLOOD EXAMINATIONS

Total number examined	...	...	...	954
Total counts of red and white cells and haemoglobin determinations	...	...	...	644
Differential leucocyte counts	...	...	...	295
Blood picture	...	...	...	15

IV. BIOCHEMICAL

(a) *Urine*

Total number examined	...	...	...	350
Total number of Examinations : 5,014				

Appendix IV

Report on the Work of the Division of Entomology

FOREWORD

During 1948 the mosquito survey of the coastal belt of the island, which was started the previous year, was almost completed. Searches for adult mosquitoes in dwellings treated with D.D.T., in the experimental areas of Black River and Grand Port, were continued as well as investigations of the partial spraying of huts having regard to a possible repellent action of D.D.T.

The interpretation of results is not easy as the last few years have been abnormally dry during which a severe drought has been experienced in certain parts of the island, causing a reduction in the number, as well as in the extent, of anopheline breeding-grounds. The number of mosquitos has in general kept on diminishing gradually with a corresponding fall in the incidence of malaria. It is therefore difficult to judge the exact effect of D.D.T. and it would be illogical to ascribe to its action alone the total absence of resting anophelines, even in partially treated houses. There seems to be no doubt however that houses treated with D.D.T. show an almost complete absence of *A. funestus* for several months.

The staff of the Malaria Eradication Scheme of the Colonial Insecticides Committee arrived in the Island in November. On the 13th of December, five fully trained moustiquiers of the division were transferred to the scheme. The writer has acted as a guide to their Entomologist in his tours of inspection and has taken the Field Overseers round their respective sections and helped them in the choice of mosquito catching stations.

MOSQUITO SURVEYS

Details of the survey which began in the district of Savane in mid-October 1947 were not published in that year's report as it was thought to be preferable to await the termination of the survey so as to be able to give figures for the whole coastal belt of the district in the same table.

TABLE I

DISTRICT CENSUS OF THE ADULT MOSQUITO POPULATION MADE CHIEFLY IN THE DWELLINGS
OF THE COASTAL BELT

Date	Place	No. of blocks searched	No. of rooms in blocks	Number of adult mosquitoes found					
				<i>A. funestus</i>		<i>A. gambiae</i>		<i>A. melas</i>	
				♀	♂	♀	♂	♀	♂
1947									
SAVANE									
16th to 17th October	Ma Condé ...	19	31	19	2	8	2	—	—
20th to 28th	Choisy ...	53	119	61	5	—	—	—	2
29th Oct. to 14th Nov.	Petit Cap ...	130	325	42	3	—	—	—	28
14th to 19th November	St. Martin ...	47	101	—	—	—	—	11	1
1st to 4th December	Bel Ombre S.E.	29	89	—	—	—	—	—	—
5th	Frédérica ...	5	7	28	—	9	—	—	2
10th to 12th	Beau Champ	11	52	—	—	2	—	—	8
15th to 17th	Chamouny ...	43	90	—	—	—	—	—	26
18th to 31st	Chemin Grenier ...	110	277	—	—	3	1	—	249
1948									
5th to 30th January	Chemin Grenier ...	134	327	—	—	5	—	—	213
30th	Luchon ...	3	7	—	—	—	—	—	—
15th to 17th March	Union St. Félix S.E.	17	51	—	—	—	—	—	5
17th to 19th	Riambel Beach ...	26	69	1	—	35	—	—	—
19th to 24th	Souillac Cemetery Region	42	109	—	—	11	—	—	56
24th March to 25th May	Souillac ...	263	698	—	—	16	—	—	603
25th May to 31st August	Surinam ...	206	534	—	—	4	—	—	165
1st and 7th September	La Martinière	14	38	—	—	—	—	—	2
9th	Mont Blanc	11	27	—	—	—	—	—	2
2nd to 6th	Bois d'Oiseaux	13	28	—	—	—	—	—	—
6th to 9th	Riambel Village	56	125	—	—	—	—	—	7
10th to 14th	St. Aubin ...	30	142	—	—	—	—	—	11
17th	Beau Bois ...	11	29	—	—	—	—	—	4
20th Sept. to 4th Oct.	Riv. des Anguilles Village	184	415	—	—	—	—	—	56
6th to 12th October	Riv. des Anguilles S.E.	35	98	—	—	—	—	—	22
13th to 14th	St. Martin ...	34	67	—	—	—	—	21	3
15th to 19th	Bel Air—St. Félix S.E.	21	76	—	—	—	—	—	113
25th	Colmar ...	2	11	—	—	—	—	—	26
19th Oct. to 4th Nov.	Bénarès S.E.	81	228	—	—	—	—	—	29

TABLE I—continued

DISTRICT CENSUS OF THE ADULT MOSQUITO POPULATION MADE CHIEFLY IN THE DWELLINGS OF THE COASTAL BELT.

Date	Place	No. of blocks searched	No. of rooms in blocks	No. of adult mosquitoes found					
				A. funestus		A. gambiae		A. melas	
				♀	♂	♀	♂	♀	♂
GRAND PORT									
1948									
6th to 9th June ...	Rivière des Créoles	38	92	110	1	5	—	168	3
9th to 14th " ...	Bon Espoir	37	76	126	1	—	—	164	—
24th " ...	Terre Rouge	1	4	—	—	—	—	1	—
24th " ...	Camp Rajia	7	17	358	17	2	—	26	1
25th to 1st July ...	Le Vallon S. E.	40	122	141	3	2	—	169	7
2nd to 6th " ...	Ferney	39	85	—	—	2	—	22	—
7th to 21st " ...	Vieux Grand Port	131	282	—	—	—	—	55	1
15th to 20th " ...	Treize Cantons	16	45	—	—	—	—	12	—
21st to 23rd " ...	Belle-Vue	13	26	—	—	—	—	7	—
23rd July to 5th August	Bois des Amourettes	116	234	—	—	—	—	27	4
26th " ...	Providence	5	16	—	—	—	—	—	—
6th and 13th " ...	Anse Jonchée	18	48	41	—	—	—	28	—
FLACQ									
6th to 9th December	Poste de Flacq	59	126	164	5	13	—	668	46
10th " ...	Pont Blanc...	15	28	806	17	—	—	157	15
13th " ...	Constance	4	31	2	—	—	—	94	5
14th to 16th " ...	Belle-Mare	56	106	4	—	33	—	117	3
17th " ...	Mare la chaux	17	34	2	—	3	—	58	4
MOKA									
5th to 13th November	Alma S. E.	111	228	—	—	—	—	396	15

TABLE I—continued
DISTRICT CENSUS OF THE ADULT MOSQUITO POPULATION MADE CHIEFLY IN THE DWELLINGS OF THE COASTAL BELT

Date	Place	No. of blocks searched	No. of rooms in blocks	No. of mosquitoes found							
				A. funestus		A. gambiae		A. melas		C. fatigans	
				♀	♂	♀	♂	♀	♂	♀	♂
19th, 20th April	... RIVIERE NOIRE	31	42	—	—	30	—	—	—	330	27
18th, 19th June	Grande Rivière Noire	15	35	—	—	—	—	—	—	19	5
25th February	"	8	20	1	—	1	—	—	—	84	3
3rd March	Pointe aux Sables	7	17	2	—	2	—	—	—	16	—
22nd May	"	6	17	—	—	1	—	—	—	65	25
29th May	"	4	13	—	—	—	—	1	—	13	4
6th June	"	7	17	—	—	—	—	—	—	35	—
26th June	"	8	18	—	—	—	—	—	—	5	—
21st August	"	5	13	2	—	2	—	—	—	29	2
18th December	" Albion, Camp Creole	10	20	444	57	—	—	—	—	277	40
6th March	PORT LOUIS	8	20	—	—	9	—	—	—	48	3
1st May	Grande Rivière (left bank)	4	10	—	—	4	—	—	—	52	5
25th to 27th November	" PAMPLEMOUSES	29	67	1	—	—	—	—	—	574	38
29th to 30th November	Roche Bois (sea-side)	32	71	2	—	1	—	—	—	544	142
2nd, 3rd December	Baie du Tombeau	20	50	483	10	33	—	—	—	428	31
4th December	Terre Rouge (Bigaignon)	4	7	510	4	2	—	—	—	168	7
19th	Ville Valio	14	28	—	—	—	—	—	—	78	16
21st	Pointe aux Piments	18	51	—	—	—	—	—	2	144	217
23rd	Trou aux Biches	4	40	—	—	—	—	—	—	54	—
24th	Mon Choisy	12	31	—	—	—	—	—	—	64	1
	Pointe aux Canonnières			—	—	—	—	—	—		
27th December	RIVIERE DU REMPART	42	96	—	—	—	—	—	—	202	46
30th	Grand Baie	25	52	—	—	66	3	—	—	516	225
	Cap Malheureux			—	—			—	—		

When going through the figures, one notes the finding of only one *A. funestus*, in a house on the sea-board in the Souillac end of Riambel, and one is struck by its absence from the rest of the region east of Petit Cap. *A. gambiae* was found only in small numbers, in and around Souillac.

The zone just referred to was one of high malarial endemicity. An Admiralty survey made in 1942 by Dr. Twining gave the following figures for spleen index—

Bel-Ombre	...	...	93	Union	...	...	...	...	90
Beau-Champ	...	...	87	Rivière des Anguilles S.E.	...	...	...	...	82
Riambel	...	...	87.5	Bel Air St. Félix	...	...	...	...	80
St. Aubin	...	...	66.0	Benarès	...	...	...	...	61

The scarcity of *A. gambiae* now the predominant anopheline in the region was due to its natural and gradual elimination by the periods of severe dry weather mentioned above. As regards *A. funestus*, the treatment of all sugar estate dwellings with D.D.T. and the maintenance of all streams, in and near inhabited centres, in a good state of upkeep are sufficient to account for its disappearance from dwellings.

In Grand Port the survey was extended along the coast skirting the bay. After this, as only a few months remained before the start of the D.D.T. campaign covering the whole of the island, partial surveys of the other districts were made, in regions of known anopheline density.

THE EFFECTS OF D.D.T.

Though owing to abnormal climatic conditions detrimental to the life and the propagation of anophelines, it is difficult to assess with exactitude what measure of reduction is due to D.D.T. and what due to continued drought, one can safely say that the encouraging results, published in last year's report, have again been duplicated.

The experimental application of D.D.T. by Government was started in the Bambous Flic-en-Flac region in June 1946 and the year after, in May, in the eastern part of Grand Port. In addition to this, all the sugar estates in the other surveyed parts of the Island had their dwellings treated by the Mauritius Fumigation and Pest Control Service, Mr. R. L'Homme's organization. As I have no details of the latter's work cannot say for how long the treatment had been going on but when the mosquito survey was made, as can be seen from the census table, in the 852 rooms searched at Bel Ombre, Beau Champ, Union-St. Félix, St. Aubin, Beau Bois, Rivière des Anguilles, Bel Air St. Félix, Bénarès, Ferney and Constance only 6 anophelines were found, 4 of which being *A. gambiae*.

The following table shows the findings in the experimental zones treated by the D.D.T. section of the Department—

TABLE II
SEARCHES IN ROOMS TREATED WITH D.D.T

			Last applica- tion of D.D.T. (months)	No. of rooms searched	No. of adult mosquitoes found			Time of searches		
					A. <i>junestus</i>	A. <i>gambiae</i>	C. <i>fatigans</i>			
GRAND PORT										
17th to 19th Feb	...	Union Vale S.E.	...	2½	82	—	—	9	Day	
24th February	...	do	...	—	14	—	2	6	Night	
28th April to 3rd May	...	do	...	5	* 72	—	—	12	Day	
22nd Feb to 2nd March	...	Carreau Esnouf (Union Vale)	...	3	74	—	186	110	Night	
4th to 6th May	...	do	...	5	59	—	—	65	Day	
15th November	...	do	...	11	35	—	—	50	Day	
17th to 18th Nov.	...	do	...	11	39	—	—	75	Night	
11th August	...	Grand Bel Air	...	1½	59	—	—	3	Day	
20th February	...	Mon Désert S.E.	...	1	13	—	—	12	„	
7th May	...	do	...	3¼	19	—	—	41	„	
21st to 22nd Feb.	...	Carreau Cassia	...	3	24	—	—	41	„	
9th to 13th Feb.	...	Savannah S.E.	...	3	136	—	—	109	„	
14th February	...	La Sourdine	...	3	16	—	—	3	„	
14th May	...	do	...	6	20	—	—	111	„	

In these same areas where 6,000 anophelines were found during day-time knock-downs before the application of D.D.T., only 2 *A. gambiae* were encountered. It will be noted that the rooms remained free from *A funestus* even 10 months after the last spraying.

THE NIGHT MOVEMENT OF ANOPHELINES AND THE REPELLENT
ACTION OF D.D.T.

As experiments made by me last year on the partial spraying of huts gave results almost as good as with totally treated ones I formed the impression that D.D.T. had a repellent action. If this is so, no anophelines should be found in the treated huts at night. Knock-downs were therefore made at night at Union Vale, and at Flic-en-Flac, between 20 and 23 hours. At Union Vale 127 rooms were sprayed with Pyagra and at Flic-en-Flac 40. No *A. funestus* were found in either ; but in the former place where *A. gambiae* were obtained before D.D.T. treatment, 188 of the latter were collected.

As some of the rooms were searched before the application of D.D.T. the following comparative figures are of interest—

TABLE III.

				No. of Anophelines found			
				Before D.D.T		After D.D.T.	
				A. <i>funestus</i>	A. <i>gambiae</i>	A. <i>funestus</i>	A. <i>gambiae</i>
Union Vale (Carreau Esnouf)	...	27		2,615	387	—	38
Flic-en-Flac	...	4		564	—	—	—

I am of opinion that these experiments show that D.D.T. has a *selective repellency* towards *A. Funestus*. That *A. Gambiae* is found inside, as before, seems a good sign for it may mean that they have to come to rest in contact with the D.D.T. and then go away to die.

EFFICACY OF ANTI-MALARIAL WORKS

It will be seen from the census table that no anophelines were found in the dwellings searched along the coast of Grand Port bay, between Ferney and Anse Jonchée. This zone had been the scene of considerable antimalarial work carried out by me during the war and it shows how major works carried out thoroughly can be beneficial. In contrast, Anse Jonchée which had not been so treated, a little further east produced 41 *A. funestus*. The endemicity in the area, before the works were started, was above 50 per cent.

SEASONAL FLUCTUATION OF THE MOSQUITO POPULATION

To show this, Volmar was chosen as conditions for breeding remain much the same throughout the year. The only factor which varies greatly is the temperature. The following table gives figures for searches made between the months of March and November.

SEASONAL FLUCTUATION OF THE MOSQUITO POPULATION AT VOLMAR

			No. of Adult mosquitoes found					
			<i>A. funestus</i>		<i>A. Gambiae</i>		<i>C. fatigans</i>	
			♀	♂	♀	♂	♀	♂
March 8th to 11th	...	95	1,452	28	136	—	231	4
April 21st to 24th	...	72	3,468	3	106	—	93	—
June 15th to 17th	...	59	4,907	37	32	—	33	—
July 31st to August 10th	...	44	1,309	27	5	—	4	—
October 23rd	...	12	525	—	2	—	8	13
November 19th to 23rd	...	52	2,537	220	137	—	882	128

TOTAL MALES AND FEMALES PER 100 ROOMS

March	...	...	...	...	1,558	14	247
April	...	...	...	...	4,821	147	129
June	...	...	...	...	8,414	54	56
July-August	...	...	...	...	3,036	12	9
October	...	...	...	...	4,375	17	175
November	...	...	...	...	5,302	263	1,010

The peak for *A. gambiae* is in April whilst *A. funestus* continues to increase in numbers until June. Though the numbers for both anophelines go down a little during mid-winter, the insects are always present, wherever marshes occur, all round the island, on the sea-board.

ANOPHELES MELAS

This anopheline which was found for the first time, in November 1947 at St. Martin (Savane) has been obtained from various places along the rest of the coast-line. Up to the time of writing, it has been found at Pte-aux-Sables. Trou-aux-Biches, Roches Noires, Pointe à Fayette, Poste de Flacq and Trou d'Eau Douce.

LABORATORY WORK

Breeding of larvae and adults, the examination of all specimens brought in daily and the mounting of adults have been going on as usual. The identification of specimens knocked-down by spray in houses is a tedious job as the insects have their scales sometimes considerably damaged by the oil. The recorded number of anophelines examined for identification is 20,109.

812 live adult anophelines were hand-caught and brought to the Central Laboratory for dissection, in order to ascertain the monthly rate of infectivity.

PUBLICATIONS

- Gebert, S. (1948). Notes on Certain Aspects of the Action of D.D.T. Residual Sprays and on the Partial Treatment of Dwellings as a means of Anti-Anopheline Protection.
Trans. R.Soc. Trop. Med. Hyg. Vol. 42 p. 295.

ACKNOWLEDGEMENTS

I wish to say how thankful I am towards Dr. H. D. Tonking, the Senior Pathologist, for his hospitality at the Central Laboratory and for the useful advice tendered by him on many occasions. To his staff, as well as to mine, especially to Mr. L. Legrigore, go my thanks for their loyal co-operation. I am also grateful to the public for their help. To Mr. Paul de Maroussem we are indebted for his having allowed us to use his estate of Volmar as an experimental ground, at all times of the day or night.

S. GÉBERT,

31st January, 1948.

Entomologist, Medical Services.

Appendix II

Report on the Mental Hospital, for 1948**I. Administration**

Dr. R. Comty, the superintendent, left the Colony on European leave on the 10th May and Dr. Brunel acted in his stead as from the same date. Dr. A Vellin, a private medical practitioner, replaced Dr. Brunel as Medical Officer.

Mr. Arouff was appointed to the newly created post of Head Attendant and Mr. Thomas to the post of Assistant Head Attendant on the 1st July.

The nursing staff was strengthened by the appointment of 7 additional dressers and 11 nurses, and this additional staff made it possible to institute an eight hour day scheme for the nursing staff.

II. Hospital accommodation

There is still some overcrowding on both the male and the female sides. One female ward of 40 beds has been completed. Two male wards of 40 beds are under construction. The accommodation in the female infirmary is also insufficient. It is hoped that the construction of a new female infirmary which will improve the existing conditions will be started in the near future.

III. Hospital population

There were 611 certified insane patients (male 346, female 265) in hospital on the 31st December, 1948, as compared with 590 (335 male and 255 female) at the close of the preceding year. The daily average number of resident was 659 (male 370, female 289) as compared with 676 in 1947, 698 in 1946 and 708 in 1945. The maximum daily number resident during the year under review was 689 (male 390 and female 299) against 732 (male 408 and female 324) in 1947.

51 certified patients were on 4 days' leave (G.N. 239/24) on the 31st December 1948.

IV. Admissions

TABLE OF ADMISSIONS, DISCHARGES AND DEATHS

	Male	Females	Total
Patients in hospital on 31st December 1947	335	235	640
Certified patients on 4 days leave on 31.12.47 (G.N. 239/24)	17	19	
Patients awaiting examination by District Commissioners on 31st December, 1947	5	9	
Number of admissions (direct) in 1948 :			
1st admissions	80	68	191
2nd admissions	19	13	
3rd admissions	2	5	
4th admissions	3	1	
Number of admissions from probation	83	48	131
Number of admissions under interim detention (later found sane and released)	49	33	82
Number of admissions awaiting examination by Commissioners in Lunacy	3	6	9
Number of patients admitted under interim detention who died whilst so detained (including 1 male who was transferred to Victoria Hospital where he died) ...	2	1	3
DISCHARGES			
Number of Discharges during 1948	155	101	256
Number of patients released of those awaiting examination on 31st December, 1947	3	2	5
Number of patients who died whilst on leave under G.N. 239/24	1	2	3
Number of patients on 4 days leave G.N. 239/24 on 31st December, 1948	—	—	51
Number of deaths during 1948	20	18	38

The above table shows that there were admitted into the Mental Hospital, as certified insane patients (1st, 2nd, 3rd, 4th admissions) a total of 191 patients (Male 104 Female 87) hereunder referred to as direct admissions as compared with 175 (Male 93 and Female 82) in 1947. 131 patients were admitted from probation.

V. Causes of Insanity

The prominent etiological factors were as usual, heredity, domestic worry, alcohol, epilepsy, the puerperal state and to a lesser degree, syphilis.

VI. Discharges

256 patients were discharged by the Central Board as against 235 in 1947, 59 patients out on probation were found cured and finally discharged.

VII. Deaths

38 deaths were registered during the year, being 20 male and 18 female, against 54 in 1947 and 69 in 1946. The death rate, calculated on the daily number of patients was 5.76 per cent compared with 7.08 per cent in 1947 and 9.09 per cent in 1946.

+ post-mortem examinations were made.

The following table shows the causes of death and the number of deaths from each cause—

	Male	Female	Total
Epidemic, Endemic and Infectious Diseases :			
Dysentery	2	—	2
Tuberculosis	1	2	3
General Diseases not mentioned above :			
Pellagra	1	4	5
Anaemia	—	1	1
Debility	—	3	3

						Male	Female	Total
Affections of the Nervous System and Organs of—								
Senses :								
Cerebral haemorrhage	...	...	...	...	...	1	—	1
General paralysis	...	...	...	...	...	1	—	1
Epilepsy	...	...	...	...	...	1	—	2
Circulatory System :								
Cardiac failure	...	...	...	...	...	1	1	2
Myocardial degeneration	...	...	...	...	...	3	1	4
Arterio-Sclerosis	...	...	...	...	...	3	—	3
Respiratory System :								
Bronchitis	...	...	...	...	...	1	1	2
Pneumonia	...	...	...	...	...	2	1	3
Oedema of glottis	...	...	...	...	...	—	1	1
Digestive System :								
Appendicitis	...	...	...	...	...	1	—	1
Enteritis	...	...	...	...	...	1	1	2
Genito-Urinary System :								
Pyelonephritis	...	...	...	...	...	—	1	1
Nephritis	...	...	...	...	...	1	—	1
Affections of old age :								
Senile Myocarditis	...	...	...	...	...	—	1	1
						20	18	38

VIII. Infective and Parasitic diseases

There were 107 cases of dysentery among the inmates (14 amœbic, 22 bacillary and 71 undefined) during the year against 178 cases (42 amœbic, 46 bacillary and 90 undefined) in 1947. The incidence of typhoid is also on the decrease, 4 cases (female) being recorded as compared with 12 in 1947. All our patients on their first admission are inoculated against typhoid and the others are given a T.A.B. injection once a year.

IX. Avitaminoses and diseases of nutrition

The incidence of Pellagra, which was one of our major problems, has considerably decreased. 14 cases were recorded during the year against 29 in 1947 and 42 in 1946. Of these 14 cases (7 male and 7 female) seven (3 male and 4 female) were registered on newly admitted patients.

X. Violence and escapes

There were 157 minor injuries sustained by patients—

5 self-inflicted, 91 inflicted by other patients and 61 accidental :

4 minor injuries inflicted by patients to female servants were recorded :

Two patients absconded from the hospital, one was caught in the outer gardens and the other was brought back by the Police.

XI. Seclusion and restraint

One female patient had to be kept under lock and key on account of violent behaviour. Mechanical restraint in the form of strait-jacket was resorted to in 7 cases (6 male and 1 female) the greatest duration in any instant was 4 hours.

XII. Modern physical methods of treatment

Shock therapy was started during the year. Insulin treatment on the 22nd February and Electro-Convulsive-Therapy (E. C. T.) on the 1st July.

Insulin treatment.—11 patients suffering from schizophrenia received insulin therapy. The results are as follows: 5 good, 2 fair and 4 no improvement. Treatment for 2 patients had to be discontinued on account of heart trouble.

Electro-Convulsive therapy.—119 patients including 11 out-patients were treated by E. C. T. with an average of eight shocks per patient.

The results are tabulated as follows—

<i>Involuntional states</i> —9 cases treated :	6 with good results
	1 „ fair „
	2 no improvement
<i>Schizophrenia</i> —66 cases treated :	33 with good results
	11 „ fair „
	22 no improvement
<i>Manic Depressive Insanity</i> —28 cases :	13 with good results
	4 „ fair „
	11 no improvement
<i>Psychoneuroses (Hysteria)</i> —4 cases	with no improvement

At the end of the period under review 10 patients were still undergoing treatment by E. C. T.

The “good” results were obtained specially in newly admitted patients (cases with 1 to 8 months standing).

Of the patients treated by E. C. T., 34 (29 well improved and 5 slightly improved) have already left the hospital.

It is as yet too soon to draw definite conclusions on the value of shock therapy from the few cases treated. We have to gather observations on a considerably larger number of cases treated and “follow-up” the patients so treated for a much longer period; but the results obtained so far appear to be very encouraging. The credit for the beneficial results obtained from shock therapy must go to the superintendent of this hospital, Dr. R. Comty, who has been instrumental in introducing these modern methods of physical treatment. E.C.T. has also afforded the opportunity for the setting-up of an out-patient department, which answers a long-felt need. This outpatient department has a threefold advantage—

(a) It helps to relieve congestion in the hospital.

(b) It allows those patients whose mental condition is not such as would render imperative their admission into a mental hospital to live in normal surroundings.

(c) It gives an opportunity for treatment to those patients whose responsible parties are reluctant to have their charges kept in a mental institution.

At the end of the year under review 11 outpatients had called for treatment (with 74 attendances) and 7 of these had remarkably improved after treatment. There is no doubt that as time passes on and the interest of the public is awakened to its possibilities, full advantage will be taken of the facilities offered by our outpatient department.

XIII. Recreation

The Police Band played once during the year. There was no cinema performance. Gramophone is played once or twice on week days, and invariably on Sundays. Cards, chess, drafts, ping-pong and football are favourite games. Piano is played almost daily by certain female patients.

It has been possible to arrange for shifts of 20 to 22 patients to go once a week to the seaside, under adequate supervision. This new addition to the amenities offered to our patients has met with a warm welcome from the inmates.

Thanks to the generosity of the Prison Authorities, four acres of land forming part of the Prisons grounds, have been transferred to the Mental Hospital for the purpose of creating special recreation grounds for our patients.

XIV. Occupational Therapy

22 patients worked in our kitchen gardens, which supply a good part of the vegetables needed by the institution. All the laundry work was done by our patients, and this, together with darning, carpentry, mattress-making, upkeep of hospital wards and grounds kept an average of 173 male and 92 female patients busy throughout the year.

An occupational therapy class has been started by two nurses of Floreal Hospital. The patients take a keen interest in their work, which will prepare them to go back to a normal, useful life as soon as they leave the institution.

ACKNOWLEDGEMENT

My thanks are due to the members of the Central Board of the Commissioners in Lunacy for the help they have always given me in the management of the hospital and to all the members of the hospital staff for their loyal co-operation throughout the year.

J. E. BRUNEL,
Acting Medical Superintendent, Mental Hospital.

Report on Nutrition for 1948

Training.—A course of training for "Village Health Workers" was started in October 1948. Five women are being trained with the object of taking posts in rural villages not yet furnished with Child Welfare or other social welfare centres. These Village Health Workers will live in their areas. They will be in direct contact with the families in their villages, and will be able to give help and advice on food problems, child care, etc., to people who normally have no access to welfare services. The students are receiving an intensive course at the Teachers Training College ending in July 1949. The course includes instruction in Domestic Science, simple hygiene, first aid and nutrition.

2. *Food supplies.*—There is still insufficient information available to obtain a complete picture of food consumption, the chief difficulty being in obtaining statistics of locally produced foods. The most important changes in the overall supply position in 1948 as compared with 1946 and 1947 were as follows—

- (a) The consumption of rice increased by 540 grammes per head per week as compared with 1947. While the consumption of wheat flour decreased by 31 grammes per head per week the figure for all cereals showed an increase of approximately 560 grammes per head per week.

(b) Fresh milk consumption increased by 440 grammes per head/week.

(c) Edible oil do do 32 do do

(d) Total fat do do 21 do do

(e) Total pulses do decreased 42 do do

but groundnut consumption increased slightly by 6 gm/head/week,

(f) Sugar consumption decreased by 42 grammes/head/week.

(g) Salt and dried fish consumption, which had increased from 13 grms. to 32 grms./head/week from 1946-47, was again slightly increased by 4 grms. head/week in 1948.

Note—The above figures are approximate, full returns for 1948 not being available at present, but they are sufficient to show the general trend.

It is worth noting that the consumption of fresh meat, fresh fish, salt fish, fresh milk processed milk and fats apart from oil, were all equal to and in some cases greater than the consumption in the pre-war period 1936-1938.

So far as the nutritive value of the per head consumption is concerned, there was still too great a proportion of Calories obtained from sugar alone (over 20 per cent of the total). The deficiency of vitamins of the B-group was still considerable. Total protein supplies were adequate, although animal protein was low.

3. *Economic Commission*.—Committee No. 1 of the Economic Commission was constituted to consider "Food Requirements and Nutritional Status in Mauritius." The report, which has been published elsewhere, summarised all the evidence available at that time. One important result of the Commission's activities was the setting up of an Inter-departmental Nutrition Committee, whose function will be to consider the total food requirements of Mauritius and the ways of reaching the requirements, and to correlate the activities of the departments concerned.

4. *Food Yeast Trials*.—Various experiments have been carried out on the use of Jamaican food yeast powder in commonly accepted foods. A trial lasting three months was made in the Industrial School at Beau Bassin, the yeast was used in biscuits for school children for 6 months and a variety of different recipes were tried on a small scale. The results can be summarised as follows—

(a) Children in schools and institutions can be easily induced to accept food yeast in tablet or in powder form.

(b) The yeast can be included in food for adults in amounts up to 6 per cent provided there is adequate supervision of cooking.

(c) 2 per cent added food yeast in bread was satisfactory, but amounts beyond this gave bread that might not prove acceptable to the public.

(d) It is certain that if food yeast could be added to some article of food universally consumed, such as flour, it would do much to make good the deficiency of B-vitamins. The chief problem at present is one of mixing and distribution on a large scale.

5. *Bambous Survey*.—A quantitative survey of food consumption was carried out in the village of Bambous, Black River. The survey took three weeks to complete and covered a total of 125 families. It was possible to obtain only a record of one day's consumption for each family, but qualitative checks showed that there was very little day to day variation. Bambous is a comparatively poor village, and the figures showed an average level of intake that was low in respect of all nutrients.

One interesting and unexpected feature of the survey was the number of housewives who voluntarily expressed a desire for classes and demonstrations in such subjects as needle work and child care. It is hoped that the Village Health Workers will be able to meet this demand in some areas.

While a survey of this nature gives useful information as to food consumption, distribution etc., the obtaining of similar information from representative areas all over Mauritius would take a considerable time and would need a large number of trained investigators. A modified form of survey which gives information as to the frequency of consumption of different foods under different conditions, but little idea of quantity, can also be useful. In accordance with the recommendations of the Economic Commission a large scale survey of this modified type is being planned for 1949.

6. *School Meals.*—(a) *Full meal.* From January to June 1948 the scale of diet given to the 1,600 school children in the Grand Port area was increased considerably. Additional vegetables, pulses and fresh fish were given, making a meal of high nutritive value. During this period the Schools Medical Officer carried out treatment for malaria and hookworm in certain schools. The results have been given in the report of the Schools Medical Officer, and as was to be expected there was a very marked improvement in the health of the children.

A meal of this type could not be continued indefinitely owing to the high cost (35 cents per child per day) and once the results were clear the meal was modified and the scale reduced. The meal given from June onwards was still an improvement on the original scale, and included pulses and groundnuts daily. The children continued to benefit on this diet.

(b) *Snack meal.* 1,300 children continued to receive powdered skimmed milk and sugar, biscuits and yeast tablets daily. At the beginning of the year the biscuits were made from wheat flour with 2 per cent added food yeast. These were acceptable to the children, but not entirely satisfactory being rather hard and not very sweet.

In June 1948, a new kind of biscuit was made. This consisted of 50 per cent groundnut residue crushed to a fine powder, and 50 per cent manioc and sugar. They were made Mr. Rault of Mahebourg who was most helpful in experimenting with the groundnut residue, which had not been used before for human consumption in Mauritius. Each biscuit weighed 10 grammes, and a daily ration of four biscuits per child was given. They were a great success, being palatable and only half the cost of the wheaten biscuits. Owing to the high protein, fat and vitamin-B content of groundnut residue the nutritive value of the biscuits is comparatively high.

From June onwards the children were given Jamaican food yeast tablets instead of the locally made tablets, as the nutritive value of the imported tablets is probably greater.

The effect of the snack meal on the health of the children has been disappointing. Every effort was made to persuade the parents that it was intended as a supplement, not a meal, and that the children should not receive less food at home. To start with, the parents co-operated, but it became evident during the year that many of them were cutting down the children's home food. As a result these children received no more, and in some cases less food during the day than before the snack was given. This inevitably defeated the aim for which the snack was planned, i.e., to supplement the deficiencies of home food at low cost without giving a full meal. The health of the children as shown by height-weight measurements and skin signs of deficiency has not actually deteriorated, but neither has it improved noticeably, and they have as a general rule maintained their original level.

7. *Institutional Feeding.*—(a) *Poor Law Institutions.* The grant of extra money for feeding children in Poor Law Institutions and orphanages unfortunately had to be removed after it had been in force for two months. It was not possible therefore to continue with the increased diet scale recommended the previous year. Periodic visits have been made to the institutions and the diets have been improved as far as was possible within the limits of expenditure allowed. Definite improvements have been made in some cases, but the scale for children cannot be considered entirely adequate.

(b) *Prisons.* There was an increasing incidence of pellagra in the Beau Bassin prison towards the end of 1948. The diet scale was examined and checked and proved to be providing an average daily intake as follows—

Calories	...	...	...	2,300
Total protein	...	...	...	79 Grams
Fat	...	...	...	25 Grams
Carbohydrate	...	...	...	434 Grams
Calcium	...	...	...	300 milligrams
Iron	...	...	...	21 milligrams
Vitamin A	...	...	...	4,500 I.U.
Vitamin B ₁	...	...	...	0.88 milligrams
Riboflavine	...	...	...	0.78 milligrams
Nicotinic acid	...	...	...	7.9 milligrams
Ascorbic acid	...	...	...	46 milligrams
(Based on Edible Portion of raw food)				

This diet is not entirely adequate in all respects, but the B-vitamin intake does not appear to be so low as to account for the cases of pellagra. However the prisoners were receiving 210 grams of 75 per cent extraction maize-meal on 6 days in the week. Work in other countries indicates that the uses of a high-extraction maize as the staple cereal may cause pellagra.

It was recommended therefore that the maize should be replaced by bread or rice on three additional days in the week, that yeast tablets should be issued daily, and some other small changes made. The new scale is expected to come into force in 1949.

8. *Lecture Courses : Exhibitions.*—Lecture courses have been given to Social Welfare workers and Sanitary Inspectors. Courses have been also given in Creole in Child Welfare Centres.

A section showing simple principles of nutrition formed part of the Curepipe Exhibition in October. This section was also shown in Rose Belle, with the main exhibition of the Medical and Health Department, to representatives of different Village Councils. It was repeated for the schoolchildren of Rose Belle.

Thanks are due to the Schools Medical Officer, who was responsible for the success of the experimental full meal; also to the staff of the School Meals Centre, and the teachers in the schools concerned, for their co-operation.

Thanks are also due to the staff of the Teacher's Training College who have undertaken the training of the Village Health Workers.

J. C. CHETTLER,
Nutrition Officer.

Appendix IV

Annual Report of the Dependency of Rodrigues for the Year 1948

1. GENERAL

During 1948 the Dependency has been endowed with two new institutions—

- (a) A hospital dispensary at La Ferme which was opened as a dispensary on the 1st February and completed by the accommodation of two wards for inpatients in December.
- (b) A separate maternity unit has been annexed to Port Mathurin Hospital under the charge of a qualified midwife.

While a large part of the population has taken full advantage of the medical assistance afforded them by La Ferme Hospital, it has not yet been possible to use the latter institution owing to the lack of bedding material and scarcity of skilled labour.

Nevertheless, ante-natal consultations have been organised and started in Port Mathurin, Mt. Lubin and La Ferme by the midwife in October. The attitude of the female population to this innovation has been one of wilful co-operation and the figures recorded for these consultations are significant on this point.

Generally speaking, the climatic conditions were good despite a spell of drought, and food crops and live stock were plentiful, so that the people were well fed and clothed.

Damaged houses have been gradually repaired, new ones built up, always of the same standard size and pattern, regardless of the number of their inmates, so that overcrowding exists almost everywhere, as large families are the majority. However the incidence of disease has been very low. Comparatively few cases of scabies, dysentery, enteritis have been recorded—only a small outbreak of chicken-pox and mumps with few complications.

I left the island on the 25th August to attend a special session of the Assizes in Mauritius for a case of manslaughter and returned on the 2nd October. Dr. H. Levieux who was replacing me during my temporary absence sailed on the 12th October.

2. VITAL STATISTICS

The present population is approximately 13,000.

There were 390 births (making a live birth rate of 30 per thousand) and 11 still-births; last year there were 532 births.

Deaths: 162 deaths were registered of which 79 among children of 2 years and under. The annual death rate was 12.46 per thousand persons living. The net increase of the population was therefore 18 per thousand.

3. HOSPITALS AND DISPENSARIES

A. Port Mathurin Hospital

- (a) Dispensary attendances 7,020

Prevailing diseases were enteritis, dysenteries, helminthiasis and influenza.

- (b) Inpatients: 198 patients were admitted of whom 75 provided their own food.

DISEASES AMONG INPATIENTS

Abscesses 8 ; Aerophagy 1 ; Biliary calculus 1 ; Hepatitis 2 ; Liver abscess 1 ; Cholecystitis 2 ; Dyspepsia 1 ; Gastroenteritis 1 ; Malaria 2 ; Anaemia 4 ; Impetigo 2 ; Cellulitis 2 ; Folliculitis 1 ; Heart failure 2 ; H.B.P. 2 ; Endocarditis 1 ; Fibroma Uterus 2 ; Retroverted uterus 1 ; Salpingitis 1 ; Supp. Bartholinitis 1 ; Acute Cervicitis 1 ; Spontaneous posterior colpotomy 1 ; Threatened, complete abortion and haemorrhage of pregnancy 8 ; Retained placenta 2 ; Puerperal Sepsis 1 ; Confinement 30 ; Tuberculosis of lungs 2 ; Bronchitis and Br. Pneumonia 5 ; Asthma 1 ; Gonorrhoea 3 ; Primary syphilis 2 ; Soft Chancre 1 ; Phagedonic ulcer 1 ; Paraurethral abscess 1 ; Fracture of clecranon 1 ; Compound fracture of wrist 1 ; Incomplete fracture of tibia 2 ; Fracture of humerus 1 ; Penetrating abdominal wound 1 ; Burn 1 ; Amoebic dysentery 7 ; Bacillary dysentery 3 ; Rheumatism 1 ; General debility 4 ; Unclassified 69 ; Neurosyphilis 2 ; Polyneuritis 1 ; Cancerous neuritis 1 ; Hemiplegia 1 ; Beriberi 1 ; Mental cases 4 ; Phimosi 1 ; Hydrocele 1.

DEATHS IN HOSPITAL

Five patients died in Port Mathurin from the following causes . Broncho pneumonia 1 ; Toxaemia (worms) 1 ; Convulsions 1 ; Beriberi (wet type) 1 ; Cancer of liver 1.

OPERATIONS

Appendicectomy 6 ; Tonsillectomy 594 ; Hydrocele 2 ; Histerectomy 1 ; Inguinal hernia (reducible) 3 ; Strangulated Inguinal hernia 1 ; Cyst 18 ; Curettage 9.

OPERATIVE MORTALITY

One case of Ranula died of shock 24 hours after operation.

DENTAL EXTRACTIONS

326 of which 10 were done under general anaesthesia.

INJECTIONS TO IN AND OUT PATIENTS

Penicillin 276 ; Camphor ether 39 ; Mercury Cyanide 141 ; Cocaine 10 ; Mercury Biniodide 353 ; Emetine 211 ; Sodium Cacodylate 161 ; Sodium salicylate cum lugol 178 ; N. A. B. 13 series ; Hydnocarpus 405.

VACCINATIONS

127 of which 20 were unsuccessful.

Lepor patients under treatment 10.

B. Mount Lubin Hospital

(1) Dispensary attendances 7,599 of which only one patient paid for his medicine. This shows a decrease of 6,656 attendances on last year's figures.

The main diseases were : Ankylostomiasis, Influenza and Dysenteries During the year there has been a mild outbreak of chicken pox and mumps

(2) *Inpatients*.—90 inpatients were admitted, of whom 76 provided their own diets.

Diseases among inpatients.—Abscesses : 13 ; Gastroenteritis : 2 ; Cholecystitis : 1 ; Ankylostomiasis : 2 ; Anaemia : 1 ; Heart failure : 2 ; H.B.P. : 2 ; Gangrene : 2 ; Syphilis : 7 ; Gonorrhoea : 2 ; Influenza : 1 ; Bronchitis : 7 ; Bronchopneumonia : 3 ; Pleuritis : 1 ; Asthma : 1 ; Pulmonary Tuberculosis : 3 ; Ophthalmia neonatorum : 2 ; Conjunctivitis : 2 ; Epididymitis : 1 ; Salpingitis : 3 ; Metrorrhagia : 1 ; Abortion : 1 ; Burn : 1 ; Rheumatism : 6 ; Injuries : 3 ; Unclassified : 3.

Deaths in Hospital.—Heart failure 1 ; Burn : 1.

Operations.—56 miscellaneous operations were done, of which 11 under general anaesthesia.

Dental extractions.—332 of which 2 under general anaesthesia.

Injectons to in and out patients.—Camphor ether: 13 ; Mercury cyanide: 80 ; Cocaine: 7 ; Hydnocarpus: 40 ; Mercury biniodide: 232 ; Sodium Salicylate: 50 ; Emetine : 610 ; Strychnine Sulphate 40 ; Sodium cacodylate 40 ; N.A.B. : 60.

Vaccinations.—171 of which 143 were successful.

Lepers patients in attendance 3.

C. La Ferme Hospital

This hospital was open to inpatients at the beginning of December. From 1st February to December 31st, 4,793 attendances were recorded. In December 12 patients were admitted of whom 8 provided their own food.

The main diseases were helminthiasis, influenza and dysentery. Sporadic cases of chicken pox and mumps were noted.

Diseases among inpatients.—Abscess 2 ; Biliary calculus 1 ; Pan ophthalmia 1 ; Acute tonsillitis 1 ; Unclassified 5.

Operations.—21 operations were done.

Dental extractions.—214 of which 1 under general anaesthesia.

Injectons to in and out patients.—Mercury biniodide 160 ; Emetine 248 ; Sodium cacodylate 100 ; Strychnine sulphate 20 ; Hydnocarpus 66 ; N.A.B. 24.

Vaccinations.—242 of which 232 were successful.

Lepers under treatment 4.

4. ANTE-NATAL CONSULTATIONS

55 pregnant women have been examined by the midwife under my supervision in Port Mathurin, La Ferme and Mount Lubin hospitals, during the last quarter of the year.

5. MISCELLANEOUS

Patients sent to Mauritius : 10 of which 4 cases fibroma of uterus and 1 cyst of ovary.

Port.—The auxiliary vessel La Perle called three times and S. S. Zambezia three times also during the year. Free pratique was given in each case.

Police and Prisons—A weekly inspection of prisoners was held. Five cases of venereal disease were detected and treated and one was admitted to hospital.

Members of the Police Force reported sick on 40 occasions.

Autopsies.—6 autopsies were performed in Port Mathurin mortuary room, of which 5 for drowning and one for manslaughter.

Food Inspection.—262 slaughtered animals (oxen) were examined in Port Mathurin and 12 at La Ferme. No communicable disease was noted.

6. CONCLUSIONS

- (a) The population has shown an increase of 18 per thousand.
- (b) The standard of nutrition of the inhabitants was good.
- (c) La Ferme Hospital has proved to be of considerable medical and physical assistance to the people residing in the western section of the Island.
- (d) The initiation of antenatal consultations under the control of a registered midwife has been much appreciated by the female population.

I am pleased to tend my best thanks to Mr. M. Rousset, the late Magistrate, and Mr. L. Bradshaw, the present Magistrate, for much valuable help.

C. D'AVOINE,
G. M. O. Rodrigues.